GLENDALE UNIFIED SCHOOL DISTRICT
223 North Jackson Street
Glendale, California 91206
(818) 241-3111

BOARD OF EDUCATION
AGENDA

April 16, 2019
Meeting No. 28
Regular Meeting

GLENDALE UNIFIED SCHOOL DISTRICT
223 North Jackson Street
Glendale, California 91206
(818) 241-3111

BOARD OF EDUCATION MEETING NO. 28
Administration Center

April 16, 2019

"Preparing our students for their future."

Please Note Times

4:30 P.M. - **Opening,**
Presentations,
Acknowledgements and Recognitions
Student Board Member Report,
Public Communications,
President's Closing Remarks,
Re-Organization of the Board

Closed Session

7:30 P.M. - **Regular Meeting,**
Public Communications,
Information,
Action, Consent Calendar,
Reports

In accordance with the Americans with Disabilities Act (ADA) the District will provide accommodations, with reasonable advanced notice, for any individual with a disability needing to participate in the Board Meeting and/or access the information herein. Please contact the Glendale Unified School District Public Information Office to request such accommodations.
In accordance with the Brown Act revisions; public records relating to a Board meeting agenda item that are distributed to at least a majority of Board members less than 72 hours before a regular meeting, may be inspected by the public at the District administrative offices during regular business hours (8:00 a.m. to 4:00 p.m.).

AGENDA

ITEM **PAGE**

A. OPENING – 4:30 P.M.

1. Call to Order and Roll Call

2. Pledge of Allegiance led by Tyler, Logan, and Kyra Freemon, students from Mountain Avenue Elementary, Roosevelt Middle, and Crescenta Valley High Schools.

3. Certification of Compliance

To accommodate the requirement of Government Code Section 54954.2 in accordance with the Brown Act revisions; the agenda for the meeting was posted on the bulletin board in the Administration Center and the Glendale Unified School District website 72 hours prior to this meeting.

4. Approval of Agenda Order

B. PRESENTATION

1. David Meyerhof - GUSD Holocaust Speaker Coordinator

Mr. Meyerhof has been coordinating Holocaust speakers at GUSD High Schools for 3 years and would like to speak to the success of the speakers and Mr. Harry Davids will speak as a survivor of the Holocaust.

2. Superintendent's Search – Leadership Profile Report

Dr. Max McGee and Dr. Maria Ott, consultants from Hazard, Young, Attea & Associates (HYA), will present a "Leadership Profile Report" to the Board of Education and propose desired characteristics based on the data from the survey and interviews with district and community representatives.

3. Glendale Unified School District Presents Promotional Video

Staff will share with the Board the newly completed Hoover High School promotional video.

C. ACKNOWLEDGEMENTS AND RECOGNITIONS

a. ***2019 Scholastic Bowl Essay Winners*** – The Board of Education wishes to recognize Clark Magnet High School as the winning essay team of the District's 2019 High School Scholastic Bowl Essay Competition.

b. ***2019 Scholastic Bowl Champions*** – The Board of Education wishes to recognize Crescenta Valley High School as the winning team of the District's 2019 High School Scholastic Bowl. The annual competition, now in its 29th year, engages teams from Clark Magnet, Crescenta Valley, Glendale, and Hoover High Schools. The Crescenta Valley High School Team answered the most questions from the five content areas: Science, Mathematics, Art, Social Science, and Literature/Language Arts.

D. STUDENT BOARD MEMBER REPORT

1. Student Board Member Sophia James will report on activities and events happening at the schools around the District.

E. COMMUNICATIONS FROM PUBLIC

1. Public Communications

ADDRESSING THE BOARD OF EDUCATION—An individual or group representative may address the Board of Education on any agenda item or subject within its jurisdiction by completing a request card. Speakers are requested to state their name prior to speaking to the Board. Not more than five minutes may be allotted to each speaker and no more than twenty minutes to each subject, except by unanimous consent of the Board of Education. A Speaker's allotted time cannot be deferred to another speaker. Board Members may question the speaker but there will be no debate or decision. The Interim Superintendent may refer the matter to the proper department for review. A student's parent/guardian, or a student if age 18 or older, may request that the minutes exclude the student's directory information, as defined in Education Code 49061, or a parent/guardians' personal information, as defined in Education Code 49073.2. The request to exclude such information shall be made in writing to the secretary or clerk of the Board.

F. PRESIDENT'S CLOSING REMARKS

G. REORGANIZATION OF THE BOARD OF EDUCATION 9

1. Rotation of Officers Consistent with Board Policy 9100

a. **President**
b. **Vice President**
c. **Clerk**
d. **Position 4**
e. **Position 5**

2. Seating of Board Members

The newly selected Board officers will take their new places at the dais.

H. CLOSED SESSION

1. Instructing designated representative, Dr. Kelly King, Interim Superintendent of Schools, regarding collective bargaining matters pursuant to Government Code §54957.6.

2. Personnel matters relating to the appointment, employment or evaluation of school based and non-school based district management positions pursuant to Government Code §54957.

3. Personnel matters relating to the discipline, dismissal and release of school-based employees pursuant to Government Code §54957.

4. Conference with Legal Counsel - Anticipated Litigation – Initiation of litigation pursuant to section 54956.9(c): One potential case

5. Public Employment - Government Code §54957
Title: Superintendent of Schools

6. Conference with Real Property Negotiators pursuant to Government Code 54956.8
Property: Approximately 40,000 square feet of real property, referred to as a portion of the District Office Site, located at 223 N. Jackson Street, Glendale California 91206 (Property)
Negotiating Parties: Glendale Unified School District (Proposed Exchangor), Dr. Kelly King, Interim Superintendent, Constance Schwindt, Atkinson, Andelson, Loya, Rudd & Romo, and property consultant Sam S. Manoukian, RE/MAX; and one or more representatives from Carmel Partners which may acquire the Property through an exchange agreement pursuant to applicable California law (Proposed Exchange)
Under Negotiation: Instructions to negotiators will concern terms as related to the possible exchange of the identified Property.

7. Conference with Legal Counsel - Existing Litigation - Government Code §54956.9 (d)(1)
Case No.: EEOC 846-2017-13793

I. RETURN TO REGULAR MEETING

1. Call to Order

J. COMMUNICATIONS FROM PUBLIC

1. Public Communications

ADDRESSING THE BOARD OF EDUCATION—An individual or group representative may address the Board of Education on any agenda item or subject within its jurisdiction by completing a request card. Speakers are requested to state their name prior to speaking to the Board. Not more than five minutes may be allotted to each speaker and no more than twenty minutes to each subject, except by unanimous consent of the Board of Education. A Speaker's allotted time cannot be deferred to another speaker. Board Members may question the speaker but there will be no debate or decision. The Interim Superintendent may refer the matter to the proper department for review. A student's parent/guardian, or a student if age 18 or older, may request that the minutes exclude the student's directory information, as defined in Education Code 49061, or a parent/guardians' personal information, as defined in Education Code 49073.2. The request to exclude such information shall be made in writing to the secretary or clerk of the Board.

K. INFORMATION

1. Acknowledgements of Service 10

The resignations and retirements of the employees listed have been accepted by the Assistant Superintendent, Human Resources, as effective and final per Board Policy 4117.2, 4217.2, and 4317.2, and are being reported to the Board of Education for its information.

2. Proposal to Change Roosevelt Middle School to Roosevelt STEAM Academy 12

Roosevelt Middle School would become Roosevelt, Science, Technology, Engineering, the Arts and Mathematics (STEAM) Academy and would serve as a bridge between Edison and Cerritos Elementary Schools to the great STEAM programs at Glendale, Hoover, and Clark Magnet High Schools. With small but powerful changes, the school would transform to include additional STEAM options within the core and elective curriculum.

3. California Next Generation Science Standards Implementation Update - High School 16

This report will provide the Board of Education with an update on the progress of implementing the Next Generation Science Standards with particular focus on graduation requirements.

4. Proposed New and Revised Board Policies Relating to Business and Noninstructional Operations, Students, and Administration 20

This report will provide the Board of Education with information on the need to create new or revise existing Board Policies (BP) 3100 (Transfer of Funds); BP 3260 (Fees and Charges); BP 3290 (Gifts, Grants and Bequests); BP 3515.4 (Recovery for Property Loss or Damage); BP 5117 (Interdistrict Attendance); and BP 2000 (Concepts and Roles) as recommended by the California School Boards Association (CSBA) and to comply with Education Code and federal and state laws.

5. Glendale Community College Elementary Enrichment Summer School Program 2019 39

This report provides the Board of Education with information on the Glendale Community College summer school enrichment program available to elementary school students for the summer of 2019.

6. Update on Measure S and Facility Programs 40

There will be a presentation including an update on the Superintendent's Facility Advisory Committee meeting, a review of the action items on the agenda, as well as a discussion of future items that will be brought to the Board for consideration.

7. Monte Vista Elementary School Modular Bathroom Project Update 41

This report will provide an update on the Monte Vista Elementary School modular bathroom project.

L. ACTION

1. Resolution No. 23 – Remembering the Armenian Genocide and Reaffirming a Better World **44**

The Interim Superintendent recommends that the Board of Education adopt Resolution No. 23 – Remembering the Armenian Genocide and Reaffirming a Better World.

2. Resolutions - Signature Authorization and Re-Adoption of Board Policies **47**

The Interim Superintendent recommends that the Board of Education adopt Resolutions No. 24, 25, 26, 27, 28, 29, 30, and 31, and approve the signature authorizations and re-adopt the Board Policies from April 16, 2019 to June 30, 2020.

3. Appointment of Voting Representative to Elect Members to the County Committee on School District Organization **56**

The Interim Superintendent recommends that the Board of Education appoint one member as its voting representative to elect members to the Los Angeles County Committee on School District Organization.

4. Appointment of Board Representative to the Los Angeles County School Trustees Association (LACSTA) **57**

The Interim Superintendent recommends that the Board of Education designate its voting representative to LACSTA.

5. 2019 California School Boards Association (CSBA) Delegate Assembly Run-off Election **58**

The Interim Superintendent recommends that the Board of Education vote for one candidate for the CSBA Delegate Assembly, Subregion 23-A.

6. Award of Bid No. 183 – 18/19 for the FASO Wall Project **64**

The Interim Superintendent recommends that the Board of Education award Bid No. 183-18/19 for the FASO Wall Project to Golden Gate Construction in the amount of $272,322.00. This project will be funded by the Unrestricted General Fund (Fund 01).

7. Human Resources Settlement Agreement

The Interim Superintendent recommends that the Board of Education approve the revised Human Resources Settlement Agreement: Case No. EEOC 846-2017-13793

M. CONSENT CALENDAR

All items under Consent Calendar are considered to be of a routine nature and are acted on with one motion. Any recommendation may be removed from the Consent Calendar at the request of any Board Member and placed under Action.

1. Minutes **66**

The Interim Superintendent recommends that the Board of Education approve the Minutes, as listed.

a. Regular Meeting No. 26 April 2, 2019
b. Special Meeting No. 27 April 9, 2019

M. CONSENT CALENDAR - continued

2. Certificated Personnel Report No. 16 **76**

The certificated report recommends approval of the following:

A deceased, a maternity leave of absence, an extension of maternity leave of absence, parental leaves of absence, a health leave of absence, extension of health leaves of absence, family & medical leaves of absence, extension of family & medical leaves of absence, a general purpose leave of absence, a military leave of absence, an opportunity leave of absence, additional assignments, elections hourly/daily, transportation authorizations, revision to previous personnel reports, personal services agreements and conference/workshop/meeting authorizations.

3. Classified Personnel Report No. 15 **87**

The classified report recommends approval of the following:

Medical leave of absence; change of medical leave of absence; extension of medical leave of absence; family & medical leave of absence; maternity leave of absence; extension of maternity leave of absence; parental leave of absence; election from eligibility list; suspension without pay; termination - probation; additional assignment temporary - at established rate of pay; change of assignments; revisions to previous board reports; election of classified hourly substitutes; election of classified/non classified hourly substitutes; personal services agreements; and transportation authorizations

4. Warrants **97**

The Interim Superintendent recommends that the Board of Education approve Warrants totaling $20,998,267.45 for March 1, 2019 through April 10, 2019.

5. Appropriation Transfer and Budget Revision Report **103**

Budget revisions and transfers reflect changes to existing budget appropriations necessitated by increases or decreases to previously established income and expenditure accounts. The Education Code requires Board of Education approval of all budget revisions and the transfer of funds between major expenditure accounts.

6. Lease Agreement with GEF Summer School, Inc. (GEFSS) **110**

The Interim Superintendent recommends that the Board of Education approve the lease agreement with GEF Summer School, Inc. (GEFSS).

7. Authorization to Dispose of Surplus Property **120**

The Interim Superintendent recommends that the Board of Education declare obsolete textbooks located at Toll Middle School as surplus, and authorize disposal in the most cost efficient and environmentally responsible manner.

8. Quarterly Uniform Complaint Report Summary, Williams Settlement Legislation **121**

The Interim Superintendent recommends that the Board of Education approve the submission of the Quarterly Uniform Complaint Report Summary, as mandated under the Williams Court Case Settlement, to the Superintendent of the Los Angeles County Office of Education.

9. Approval of New Course of Study Outlines for Use in High Schools in the Areas of Career Technical Education and Visual and Performing Arts **123**

The Interim Superintendent recommends that the Board of Education approve course of study outlines (Robotics 3-4: 3D Design and Manufacturing; Principles of Engineering and Manufacturing 3-4 Honors; Introduction to Engineering Design Technology 1-2; Honors Photography 3-4; Photography Foundations 1-2; and Photography Seminar Honors) for use in high schools in the areas of Career Technical Education and Visual and Performing Arts.

M. CONSENT CALENDAR - continued

10. Approval of New and Revised Course of Study Outlines for Use in Middle and High Schools in the Area of Mathematics **178**

The Interim Superintendent recommends that the Board of Education approve course of study outlines (Math 8A Summer Acceleration; Integrated Math IIIA Accelerated; Integrated Math III; Integrated Math IIIB/Precalculus Accelerated; Precalculus; Precalculus Honors) for use in middle and high schools in the area of Mathematics.

11. Approval of New and Revised Board Policies Relating to Administration, Personnel, and Instruction **357**

The Interim Superintendent recommends that the Board of Education approve new or revised Board Policies (BP) 2121 (Superintendent Contract); BP 4121 (Temporary Contract/Substitute Personnel); BP 6142.91 (Reading/Language Arts Instruction); BP 6142.94 (History-Social Science Instruction); BP 6170.1 (Transitional Kindergarten); and BP 6177 (Summer School) as recommended by the California School Boards Association (CSBA) and to comply with Education Code and federal and state laws.

12. Approval of the College and Career Access Pathways Partnership Agreement **378**

The Interim Superintendent recommends that the Board of Education approve the College and Career Access Pathways Partnership Agreement with the Glendale Community College District.

13. Acceptance of DonorsChoose Awards **387**

The Interim Superintendent recommends that the Board of Education accept funding from DonorsChoose to support a project submitted by Rosemont Middle School.

14. Approval of Agreement with the University of California, Los Angeles, Graduate School of Education and Information Studies-Center X to Provide Professional Development Training and Support for Introduction to Data Services Course **388**

The Interim Superintendent recommends that the Board of Education approve a two-year agreement in the amount of $25,710 with the University of California, Los Angeles, Graduate School of Education and Information Studies-Center X to provide professional development training and support for the Introduction to Data Services course.

15. Acceptance of Gifts **394**

The Interim Superintendent recommends that gifts to the District be accepted and that letters of appreciation be written to the donors.

N. REPORTS AND CORRESPONDENCE

1. Board

2. Interim Superintendent

O. ADJOURNMENT

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

REORGANIZATION OF THE BOARD OF EDUCATION

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED IN: Office of the Superintendent

SUBJECT: **Board of Education Annual Organization Meeting**

The Interim Superintendent recommends that the Board of Education selects its officers pursuant to Board Policy 9100.

Each year, the Governing Board shall hold an annual organizational meeting to select its officers pursuant to Board Policy 9100. The Board of Education may select officers by a rotation of seats. In non-election years, the outgoing president rotates to Seat 5 and other members rotate forward.

Seat 1 – President
Seat 2 – Vice President
Seat 3 – Clerk
Seat 4 - Board Member
Seat 5 – Board Member

If the Board chooses not to rotate officers, nominations from all officers and seats 4 and 5 will be taken and voted upon in accordance with Robert's Rules of Order.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

INFORMATION REPORT NO. 1

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED BY: Dr. Cynthia M. Foley, Assistant Superintendent, Human Resources/Director of Classified Personnel

SUBJECT: ACKNOWLEDGEMENTS OF SERVICE

The resignations and retirements of the following employees have been accepted by the Assistant Superintendent, Human Resources, as effective and final per Board Policy 4040, and are being reported to the Board of Education as information only - no action required:

Resignations:

1.	Alexanyan, Julieta Education Assistant ASES/RAP Site Leader John Muir Elementary School	Effective 3/28/19
2.	Alexandi, Ramona Education Assistant I Cerritos Elementary School	Effective 4/12/19
3.	Chui, Derek Math/Science Teacher Toll Middle School	Effective 4/01/19
4.	Saig, Sarit Teacher Specialist Fremont Elementary	Effective 4/01/19

Retirements:

1.	Abramyan, Nerses Science Teacher Hoover High School	Effective 6/18/19 26 years of service

Retirements (cont.):

2.	Bible, Marcelyn English Teacher Toll Middle School	Effective 6/13/19 29 years of service
3.	Coffin, Dana Kindergarten Teacher Valley View Elementary	Effective 6/13/19 21 years of service
4.	Hammer, Les Assistant Physically Handicapped Crescenta Valley High School	Effective 6/12/19 17 years, 8 months of service
5.	Ozawa, Joie Math Teacher Glendale High School	Effective 6/13/19 38 years of service
6.	Samore, Rose Counselor Hoover High School	Effective 7/01/19 20 years of service

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

INFORMATION REPORT NO. 2

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Felix Melendez, Executive Director, Secondary Education
PREPARED BY:	Dr. Narineh Makijan, Coordinator III, Career Technical Education Dr. Kyle Bruich, Principal, Roosevelt Middle School
SUBJECT:	**Proposal to Change Roosevelt Middle School to Roosevelt STEAM Academy**

It is proposed that Roosevelt Middle School become Roosevelt Science, Technology, Engineering, the Arts and Mathematics (STEAM) Academy, which would serve as a bridge between Edison and Cerritos Elementary Schools to the great STEAM programs at Glendale, Hoover, and Clark Magnet High Schools. With small but powerful changes, the school would transform to include additional STEAM options within the core and elective curriculum. With more than 800 Chromebooks/computers on campus, a robotics lab, and a virtual reality lab, Roosevelt already has the infrastructure to move forward in exciting ways.

Additionally, the school would partner with Code to the Future and use select lessons from code.org to include computer science as part of the Science Curriculum. Code to the Future currently supports Cerritos Elementary, which is a feeder school to Roosevelt. Curriculum for all students would include HTML/CSS coding language, JavaScript, and StarLogo Nova, which provides students the opportunity to use coding to make scientific simulations in analyzing lab-style experiments on the computer. Roosevelt will also use Stanford University's Bifocal Modeling Method which would then compare actual laboratory results with the results from StarLogo Nova to look at the data in a larger context. This is a key point in California's Framework for Next Generation Science Standards section on Computer Science. Students will also engage in engineering practices that require students to use critical thinking and problem solving to achieve the desired result. Students may also use 3D printed components to support this standard.

As a part of the program, students will use Google's Applied Digital Skills curriculum, which is already included in the Google Suite for Education. The purpose of this curriculum is to create digital literacy and citizenship for students as they are frequently exposed to changing technology. Examples of available topics include:

- Research and Developing a Topic Online

- Planning and Budgeting
- Technology's Role in Current Events
- Annotate Text in Google Docs
- Create an Editing Tool with Programming

Roosevelt's seven-period day allows students to explore a large number of elective opportunities including advanced coding. This class, which would be taught by a Career Technical Education Credentialed teacher, would give students instruction in Thunkable (iOS and Android App Development), JavaScript, and Advanced Scratch. This would also be supported by Code to the Future.

Roosevelt already has several electives that support the STEAM vision:

- Robotics
- 3D Video Game Design (using Unity Augmented Reality)
- GenYes
- Visual/Digital Media Arts (Using Adobe Photoshop, Illustrator, and Lightroom)
- Traditional Arts/Music/Language Electives

Enrollment

Although the Roosevelt STEAM Academy would officially be designated with magnet school status in the 2020-2021 school year, the majority of the components of the program would be implemented in the 2019-2020 school year, including the advanced coding class.

Roosevelt Middle School has capacity for 1,000 students; the STEAM academy will allow sixth grade students from Cerritos, Edison, Franklin, and Muir Elementary Schools to join the STEAM academy during the seventh grade. While the STEAM Academy program will officially begin in seventh grade, sixth grade students who are at Roosevelt Middle School will have access to electives coursework that will increase interest in the STEAM academy.

Current students would be grandfathered in and new students who live in the attendance boundaries would be allowed to enroll directly at the school. All students who live outside the Roosevelt attendance boundaries would participate in the student lottery and would need to submit applications by January 31, 2020, to be included in the February 14, 2020, Magnet Schools and Dual Immersion Programs lottery. As with the other schools, late applications would be placed on a waiting list. The priorities for Roosevelt would be as follows:

1. Siblings of current Roosevelt students who do not live within the attendance boundaries
2. All other Glendale Unified School District (GUSD) students
3. Out of District students

The number of open spaces for students who live outside the attendance boundaries would be determined for each grade level. For the 2020-2021 school year, Roosevelt would anticipate filling an additional 50 students and would grow based on available space.

Promoting eighth grade students from Roosevelt would continue to matriculate to their home high schools. Students that live outside the GUSD attendance area would be encouraged to apply for a permit to benefit from the wide range of electives and programs that GUSD high schools offer.

Proposed Timeline for Implementation

April 16, 2019	GUSD Board of Education is presented with the proposal for Roosevelt to become a magnet school.
May 7, 2019	The proposal is presented to the GUSD Board of Education for its consideration for approval.

IF APPROVED:

May 8, 2019	A letter will be sent home to current Roosevelt families announcing the change to a magnet school/STEAM Academy and ensuring that this change does not affect their children's enrollment status.
August 2019 through June 2020	Roosevelt teachers would receive professional development and implement the majority of the components of the program in the 2019-2020 school year, with official magnet status in 2020-2021. The advanced coding class would begin in the 2019-2020 school year as well.
November 1, 2019	Applications go live on website - www.gusdmagnetandflag.com.

November 1, 2019 Through January 31, 2020

The new Roosevelt STEAM Academy will be promoted to age-eligible students on an ongoing basis throughout the community through tours, elementary school nights, etc. A particular focus will be to make connections within the community to maintain ethnic diversity and gender balances within the student population.

Advertisements will be placed in local newspapers and local reporters will be invited to cover the current STEAM program at Roosevelt. The school and enrollment at Roosevelt STEAM Academy will be featured at businesses and community centers with a particular target area east and south of Glendale in Atwater Village, Eagle Rock, Glassell Park and Los Feliz. Some of the publications that will be approached are:

- Crescenta Valley Weekly
- Glendale News Press
- Glassell Park News
- Highland Park Patch

Cost Associated with the Roosevelt STEAM Academy:

Code to the Future Curriculum:

2019-2020: $100,000
2020-2021: $100,000
2021-2022: $67,000
2022-2023: $33,000
2023-2024: $33,000

Code to the Future curriculum will be funded by Career Technical Education (CTE) department under various grants and restricted funds. It is intended to place the Code to the Future contract on the May 7, 2019, Board of Education agenda for approval.

Equipment:

The Roosevelt STEAM Academy will require minimal additional items including 3D printers, 80-inch TVs, headphones, laptops and carts. This equipment will be purchased by the CTE department with CTE Incentive Grant funds.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

INFORMATION REPORT NO. 3

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Dr. Chris Coulter, Director, Teaching & Learning
PREPARED BY:	Shawna Metcalf, Science Specialist, Teaching & Learning
SUBJECT:	**California Next Generation Science Standards Implementation Update – High School**

Background:

The CA Next Generation Science Standards (CA NGSS) are designed to ensure that all students actively engage in the scientific and engineering processes as they deepen their understanding of core ideas. By the end of 12th grade, students should have gained sufficient knowledge to engage in scientific discourse and to be critical consumers of scientific information in their everyday lives. It is especially important to note that the above goals are for all students. A CA NGSS aligned K-12 science program should prepare all students for their futures, not just those who pursue careers in these fields or those who continue on to higher education.

The high school implementation of CA NGSS is complex. In addition to ensuring all students are provided with equitable access to all standards, any decisions made regarding the high school implementation need to take teacher credential information, student science data, graduation requirements, UC requirements, staffing, and funding into consideration.

Major Considerations:

Graduation Requirements

Currently, the state of California and Glendale Unified require two (2) years of science for graduation: one (1) year of physical science and one (1) year of life science. This graduation requirement does not align with the UC/CSU "d" Laboratory Science requirement, as it does not require the science course to be laboratory based.

While the state of California is not changing its minimum science graduation requirement, implementing a fully-aligned CA NGSS high school program with fidelity requires a change in graduation requirements at the local level. Two (2) years of science is not sufficient to ensure all students have equitable access to all of the standards. If Glendale

Unified implements either the fully integrated model or the Earth & Space Science embedded model, students would need to take all three (3) years. With the four course model, students would need to take all four (4) years.

Student Data

The Teaching and Learning Department pulled and analyzed two years of student science data (Classes of 2016 and 2017) to determine how many students would be impacted by a change in course offerings and graduation requirements. Over the last few years, the following trends were identified:

Graduation Requirement

Courses Required for Graduation	
Number of Years Completed	**Percentage of Students**
4+ years	25%
3 years	48%
2 years	20%
0-1 year	7%

Four-course model

- ~75% of students would need to take one or more additional year of science
- ~27% of students would need to take two or more additional years
- All remediation would need to take place concurrently or over summer

Three-course model

- ~27% of students would need to take one or more additional year of science
- ~ 7% would need to take two or more additional years of science
- One year of remediation could take place without concurrent enrollment or summer school

UC/CSU Readiness (2 years required, 3 strongly recommended)

Courses Required for UC/CSU Readiness	
Number of Years Completed	**Percentage of Students**
4+ years	21%
3 years	37%
2 years	14%
0-1 year	10%

- Over 25% of students do not meet the UC/CSU science requirement
- Over 40% of students do not meet the UC/CSU science recommendation
- Both course models are designed to meet the UC/CSU recommendation

Impact on Advanced Placement (AP) Science

Advanced Placement Courses	
Number of Years Completed	**Percentage of Students**
4 years	0.2%
3 years	2.5%
2 years	6.5%
1 year	14%
0 years	77%

- Over 75% of students did not take AP science
- ~15% of students took one year of AP science
- ~10% of students took more than one year of AP science
- There will be no significant detrimental impact on AP science

The chart on the next page summarizes the pros and cons of maintaining the current two-year graduation requirement and expanding to a three- or four-year requirement.

Required # of Years	Pros	Cons
2 years	• Maintains current staffing and funding level • No impact on other courses	• Students do not have equitable access to all NGSS Standards • Many students will not meet a-g requirements for Science ("d" requirement) • Students will not be adequately prepared for the CAST, which will be on the Dashboard
3 years	• Aligns with three-year course models • Provides all students access to all CA NGSS standards • Aligns with UC/CSU "d" recommendation • Students will be prepared for the CAST	• Will have some impact on electives enrollment • Increased challenge for some students to complete graduation requirements • Allows for remediation and intervention
4 years	• Aligns with four-year course model • Provides all students access to all CA NGSS standards • Aligns with UC/CSU "d" recommendation • Students will be prepared for the CAST	• Will significantly impact enrollment in electives • Does not allow for remediation during the school year • Will add a significant challenge for some students meeting graduation requirements • Students would take CAST during 12th grade

Next Steps:

The final recommendation for graduation requirements will be placed on the Board of Education agenda on May 7, 2019. At the same meeting, additional information will be presented on teacher staffing, credential implications, and stakeholder recommendations.

In order to review instructional materials during the 2019-2020 school year, a decision on graduation requirements and which course model to implement needs to be made this school year.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

INFORMATION REPORT NO. 4

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED BY: Stephen Dickinson, Chief Business and Financial Officer
Hagop Eulmessekian, Director, Student Support Services
Phyllis Ishisaka, Executive Assistant to the Superintendent

SUBJECT: **Proposed Revisions to Board Policies Relating to Business and Noninstructional Operations, Students, and Administration**

This report will provide the Board of Education with information on the need to revise existing Board Policies (BP) 3100 (Budget-Planning, Development, Adoption, and Responsibility); BP 3260 (Fees and Charges); BP 3290 (Gifts, Grants and Bequests); BP 3515.4 (Recovery for Property Loss or Damage); BP 5117 (Interdistrict Attendance); and BP 2000 (Administration) as recommended by the California School Boards Association (CSBA) and to comply with Education Code and federal and state laws.

BP 3100 – Budget-Planning, Development, Adoption, and Responsibility
CSBA Update: March 2019
Last GUSD Update: July 2015

Policy is updated to reflect new law (AB 1808), which requires districts to annually develop, adopt, and post an LCFF budget overview for parents/guardians and to file the budget overview with the county superintendent of schools. In addition, section on "Long Term Financial Obligations" is revised to reflect new law (SB 1413), which establishes the California Employers' Pension Prefunding Trust Program to allow districts to prefund required contributions to the California Public Employees' Retirement System.

BP 3260 – Fees and Charges
CSBA Update: March 2019
Last GUSD Update: October 2017

Policy is updated to add new section on "Collection of Debt," reflecting new law (AB 1974), which prohibits negative action against a student or former student for a debt owed to the school and requires districts to provide parents/guardians with an itemized invoice that references applicable district policies.

BP 3290 – Gifts, Grants and Bequests

CSBA Update: October 2018
Last GUSD Update: November 2017

Policy is updated to add new section on "Online Fundraising" addressing considerations for approving a crowdfunding Internet platform to raise funds for district, school, or classroom projects or equipment. Policy also adds a prohibition against accepting any gift, grant, or bequest that promotes the use of non-nutritious foods or beverages and provides that any advertising used by a corporate sponsor meet the standards specified in BP 1325 – Advertising and Promotion.

BP 3515.4 – Recovery for Property Loss or Damage

CSBA Update: March 2019
Last GUSD Update: January 2018

Policy is updated to reflect the 2019 limits for parent/guardian liability for property loss or damage caused by a child's willful misconduct and for any reward paid for information leading to the identification of persons responsible for property damage. Policy also reflects new law (AB 1974), which prohibits the collection of debt owed by a current or former homeless or foster youth.

BP 5117 – Interdistrict Attendance

CSBA Update: March 2019
Last GUSD Update: September 2018

Staff is recommending that the Board update the Board Policy (BP) 5117 to reflect current legal and policy references based on California School Boards Association (CSBA) suggested language.

BP 2000 – Administration

CSBA Update: July 2006
Last GUSD Update: October 2003

Board Policy 2000 is being revised using CSBA suggested language.

The proposed revised Board Policies are being presented for first reading. Should the consensus of the Board be to move forward, the policies will be presented at the May 7,

2019, Board meeting for approval. Further, upon approval of the policies, updates to the accompanying Administrative Regulations will be made as needed following current District procedures.

Copies of the proposed revised policies are attached to this report.

Business and Noninstructional Operations

Budget -Planning, Development, Adoption, and Responsibility

The Governing Board recognizes its critical responsibility for adopting a sound budget each fiscal year which is aligned with and reflects the District's vision, goals, priorities, local control and accountability plan (LCAP), and other comprehensive plans. The District budget shall guide decisions and actions throughout the year and shall serve as a tool for monitoring the fiscal health of the District. The Board of Education shall establish the procedures under which the budget is to be prepared. The District Budget shall be prepared using estimates obtained from state, county, local and other appropriate sources. In accordance with legal time requirements established by the Education Code and the Los Angeles County Office of Education, the District's budget calendar shall include sufficient time for the Board of Education to study and receive comments on the proposed budget for the ensuing fiscal year. Budget proposals shall be compatible with Board Policy and long-range District goals. The District budget shall show a complete plan and itemized statement of all proposed expenditures and all estimated revenues for the following fiscal year, together with a comparison of revenues and expenditures for the current fiscal year. The budget shall also include the appropriations limit and the total annual appropriations subject to limitation as determined pursuant to Government Code 7900-7914. (Education Code 42122).

Financial Responsibility

The Governing Board is committed to meeting its financial responsibility to the public. The Superintendent or designee shall keep the Board informed about the District's financial condition and fiscal operations. The Board shall adopt sound financial policies and shall maintain accountability for the financial condition of the District.

As required by law, the Board shall assess the District's financial condition twice annually and shall certify to the Los Angeles County Office of Education whether or not the District is able to meet its financial obligations for the remainder of the fiscal year and for the subsequent two fiscal years.

The Superintendent or designee shall submit to the Governing Board regular financial reports setting forth any proposed revisions necessary to the District's budgeted revenues and expenditures.

The District budget shall provide for increasing or improving services for unduplicated students at least in proportion to the increase in funds apportioned on the basis of the number and concentration of unduplicated students. Unduplicated students are students who are eligible for free or reduced-price meals, English learners, and/or foster youth.

Business and Noninstructional Operations

Budget -Planning, Development, Adoption, and Responsibility

The Board may establish other budget assumptions or parameters which may take into consideration the stability of funding sources, legal requirements and constraints on the use of funds, anticipated increases and/or decreases in the cost of services and supplies, program requirements, and any other factors necessary to ensure that the budget is a realistic plan for District revenues and expenditures.

Budget as Spending Plan

A. Proposed Budget

In order to permit adequate lead time for purchase of supplies and equipment necessary for the opening of school in July, the administration is authorized to initiate purchase orders and other agreements in amounts up to 50% of the supplies and equipment amounts outlined in the proposed budget.

The Board shall hold a public hearing on the proposed budget in accordance with Education Code 42103 and 42127. The hearing shall occur at the same meeting as the public hearing on the District's LCAP and the local control funding formula (LCFF) budget overview for parents/guardians. (Education Code 42103, 42127, 52062, 52064.1)

B. Adopted Budget

The Board shall adopt the District budget on or before July 1 of each year.

At a public meeting held on a date after the public hearing on the budget, the Board shall adopt the budget following its adoption of the LCAP or an annual update to the LCAP at the same meeting. The budget shall include the expenditures necessary to implement the LCAP or the annual update to the LCAP.

The budget that is formally adopted by the Board shall adhere to the state's Standardized Account Code Structure as prescribed by the Superintendent of Public Instruction.

The annual line item budget, as adopted by the Board of Education, is to be considered as authorized to be implemented. District administration will take the necessary steps to recommend employment, initiate purchase orders, work orders and/or bids necessary to implement the budget.

Whenever the proposed District budget includes a combined assigned and unassigned ending fund balance that exceeds the minimum recommended reserve for economic

Business and Noninstructional Operations

Budget -Planning, Development, Adoption, and Responsibility

uncertainties adopted by the State Board of Education, the District shall provide, for each fiscal year included in the budget, the following information for public review and discussion at the public hearing:

1. The minimum recommended reserve for economic uncertainties

2. The combined assigned and unassigned ending fund balances that are in excess of the minimum recommended reserve

3. A statement of reasons substantiating the need for the combined assigned and unassigned ending balances that are in excess of the minimum recommended reserve

Long-Term Financial Obligations

The District's current-year budget and multiyear projections shall include adequate provisions for addressing the District's long-term financial obligations, including, but not limited to, long-term obligations resulting from collective bargaining agreements, financing of facilities projects, unfunded or future liability for retiree benefits, and accrued workers' compensation claims.

Budget Amendments

No later than 45 days after the Governor signs the annual Budget Act, the Superintendent or designee shall make available for public review any revisions in budgeted revenues and expenditures which occur as a result of the funding made available by that Budget Act. (Education Code 42127)

Whenever revenues and expenditures change significantly throughout the year, the Superintendent or designee shall recommend budget amendments to ensure accurate projections of the District's net ending balance. When final figures for the prior-year budget are available, this information shall be used as soon as possible to update the current-year budget's beginning balance and projected revenues and expenditures.

In addition, budget amendments shall be submitted for Board approval as necessary when collective bargaining agreements are accepted, District income declines, increased revenues or unanticipated savings are made available to the District, program proposals are significantly different from those approved during budget adoption, interfund transfers are needed to meet actual program expenditures, and/or other significant changes occur that impact budget projections.

Business and Noninstructional Operations

Budget -Planning, Development, Adoption, and Responsibility

Legal Reference: Education Code, Sections 1620-1623; 33128; 35161; 42103; 42122-42129; 33127; 35014; 35161; 41010-42647; 42103-42128; 52062; 52064.1
AB 1200 (Chapter 1213, Statutes of 1991)

Policy Adopted: 04/17/1973; 05/15/1973

Policy Amended: 02/02/1993; 07/19/1994; 02/04/2003; 07/14/2015; --/--/2019

Formerly BP 3110, 3130, 3200

DRAFT

Business and Noninstructional Operations

Fees and Charges

The Board of Education recognizes its responsibility to ensure that books, materials, equipment, supplies, and other resources necessary for students' participation in the District's educational program are made available to them at no cost.

No student shall be required to pay a fee, deposit, or other charge for his/her participation in an educational activity which constitutes an integral fundamental part of the District's educational program, including curricular and extracurricular activities. (Education Code 49010, 49011; 5 CCR 350)

As necessary, the Board may approve fees, deposits, and other charges which are specifically authorized by law. When approving such fees, deposits, or charges, establishing fee schedules, or determining whether waivers or exceptions should be granted, the Board shall consider relevant data, including the socioeconomic conditions of District students' families and their ability to pay.

The prohibition against student fees shall not ~~restrict~~ prevent the District from soliciting for donations, ~~participating in~~ conducting fundraising activities, or providing prizes or other recognition for participants in such activities and events. The Superintendent or designee shall emphasize that participation of students, parents/guardians, District employees, volunteers, or educational or civic organizations in such activities and events is voluntary. The District shall not offer or award to a student any course credit or privileges related to educational activities in exchange for voluntary donations or participation in fundraising activities by or on behalf of the student. ~~It~~ The District also shall not remove or threaten to remove from a student any course credit or privileges related to educational activities, or otherwise discriminate against the student, due to a lack of voluntary donations or participation in fundraising activities by or on behalf of the student.

The Superintendent or designee may provide information or professional development opportunities to administrators, teachers, and other personnel regarding permissible fees.

Complaints

A complaint alleging District noncompliance with the prohibition against requiring student fees, deposits, or other charges shall be filed in accordance with the District's procedures in BP/AR 1312.3 - Uniform Complaint Procedures. (Education Code 49013)

If, upon investigation, the District finds merit in the complaint, the Superintendent or designee shall recommend and the Board shall adopt an appropriate remedy to be provided to all affected students and parents/guardians in accordance with 5 CCR 4600.

Business and Noninstructional Operations

Fees and Charges

Information related to the prohibition against requiring students to pay fees for participation in an educational activity shall be included in the District's annual notification of uniform complaint procedures to be provided to all students, parents/guardians, employees, and other interested parties pursuant to 5 CCR 4622. (Education Code 49013)

Collection of Debt

The Superintendent or designee shall, in accordance with law, recover any debt owed to the District as a result of unpaid permissible student fees approved by the Board. However, the District shall not bill a current or former student for accumulated debt, nor take negative action against a student or former student because of such debt, including, but not limited to, any of the following: (Education Code 49014)

1. Denying full credit for any class assignment

2. Denying full and equal participation in any classroom activity

3. Denying access to the library or other on-campus educational facilities

4. Denying or withholding grades or transcripts

5. Denying or withholding a diploma

6. Limiting or barring participation in an extracurricular activity, club, or sport

7. Limiting or excluding the student from participation in an educational activity, field trip, or school ceremony

Legal Reference: Education Code, Sections 8239; 8250; 8263; 8422; 8482.6; 8760-8774; 17453.1; 17551; 19910-19911; 32033; 32221; 32390; 35330-35332; 35335; 38080; 38086.1; 38120; 39801.5; 39807.5; 39837; 48050; 48052; 48904; 49010-49013; 49014; 49065; 49066; 49091.14; 49557.5; 51810-51815; 52612; 52613; 56504; 60410
Government Code, Section 6253
California Constitution, Article 9, Section 5
Code of Regulations, Title 5, Sections 350; 4600-4687
United States Code, Title 8, Section 1184

Policy Approved: 07/03/2001
Policy Amended: 02/04/2003; 10/03/2017; --/--/2019

DRAFT

Business and Non-Instructional Operations

Financial Responsibility

Gifts, Grants and Bequests

A. The Board of Education may accept gifts, grants or bequests in the name of the District. While greatly appreciating suitable donations, the Board shall reject any gift which may directly or indirectly impair its authority to make decisions in the best interest of District students or its ability or commitment to provide equitable educational opportunities.

B. Gifts requiring installation, repair, or continuing maintenance must first be approved by the Chief Business & Financial Officer and responsible program administrator before the Board is requested to accept such gifts. Donated item must be compatible with District operations and meet District specifications for operation and safety.

C. It is the responsibility of a school, from its own resources, to install, maintain and repair gifts and bequests of equipment.

D. When gifts, grants or bequests are donated to the Glendale Unified School District for utilization in the funding of a certificated or classified position, the following will take place:

1. A written notification of intent to fund a particular position (certificated or classified) must be initiated by the Principal at the school site, or as applicable, the responsible administrator at the District Administration Center. This notification, accompanied by the appropriate certificated/classified personnel requisition forms, must then be sent to the Business Services Division. After approval by Business Services, all documentation will be forwarded to the Human Resources Office.

2. Positions will be funded at the established District salary rate for a minimum of a one-school-year duration and will be established, filled, supervised, reduced or eliminated according to provisions of the Education Code and District policy, practices and procedures.

3. Total funding including salary, benefits and related costs must be received by Business Services prior to position implementation.

4. Notification of intent to continue, reduce, or eliminate funding for an ensuing year must be forwarded to the Business and Personnel Offices at least 120 days prior to the conclusion of the school year.

Business and Non-Instructional Operations

Financial Responsibility

Gifts, Grants and Bequests

E. The District will not assign a monetary value to gifts other than cash presented to the District or any school. The Board of Education will, however, respond to each gift with a letter of appreciation to the donor.

F. Students and their parents are discouraged from presenting gifts to District employees.

G. Acceptance of any gift or other inducement for potentially inappropriate reciprocal action by a member of the Board of Education or District employee, relating to the operation of the District, is prohibited.

H. Some vendors of materials and supplies used by the District routinely distribute inexpensive items such as calendars and pens as part of their regular advertising program. Acceptance of these items by employees is not considered a conflict of interest.

I. The Board shall ensure that acceptance of gift, grants, or bequest does not involve creation of a program which the Board would be unable to sustain when the donation is exhausted.

J. Any gifts of books and instructional materials shall be accepted only if they meet regular District criteria for selection of instructional materials.

Corporate Sponsorship

The Board may enter into an agreement or arrangement with an outside entity for the sponsorship of an educational, athletic, or other program or activity. When appropriate, the agreement may allow the outside entity to advertise or promote its business, product, or service in District publications or on District property or web sites.

Every sponsorship agreement shall be in writing and shall be approved by the Board. The Board shall ensure that the District's relationship and arrangement with the sponsor are consistent with the District's mission, values, and goals. Any advertising or promotional message, image, or other depiction to be used by the sponsor shall meet the standards set for commercial advertising on District property and in District-sponsored publications. No message, image, or other depiction that promotes the use of obscene language, pornography, alcohol, tobacco, or

Business and Non-Instructional Operations

Financial Responsibility

Gifts, Grants and Bequests

prohibited drugs or that advocates unlawful discrimination, use of violence, or the violation of law or District policy shall be allowed.

Each sponsorship agreement shall contain statements including, but not limited to:

1. The purpose of the relationship with the sponsor, details of the benefits to the District, and how the benefits will be distributed.

2. The duration of the agreement and the roles, expectations, rights, and responsibilities of the District and the sponsor, including whether and to what extent the sponsor is allowed to advertise or promote its products and/or services.

3. The authority of the Board to retain exclusive right over the use of the District's name, logo, and other proprietary information. The sponsor's use of such information shall require prior approval of the Board.

4. The authority of the Board to terminate the agreement without any penalty or sanction to the District if the sponsor's message, business, or product becomes inconsistent with District vision, mission, or goals or the sponsor engages in any prohibited activity.

5. The prohibition against the collection of students' personal information except as allowed by law.

Online Fundraising

Any person or entity who wishes to conduct an online fundraising campaign, including a crowdfunding campaign, for the benefit of the District, a school, or a classroom shall submit a written request for prior approval to the Superintendent or designee. Approval of requests shall take into consideration compatibility with the District's vision and goals, core beliefs, instructional priorities, and infrastructure; the manner in which donations are collected and distributed; equity of the use of funds; and any other factors deemed relevant or appropriate by the District.

Any person or entity approved to conduct an online fundraising campaign shall comply with relevant District policies and procedures, including ensuring financial transparency in describing

Business and Non-Instructional Operations

Financial Responsibility

Gifts, Grants and Bequests

the purpose and use of the funds and protecting student privacy as applicable. Such person or entity shall specify that the District, rather than a staff member, classroom, or school, will own the funded resources.

Funds raised by an online fundraising campaign and donated to the District shall be subject to the same terms, criteria for acceptance, and accountability measures as any other donation as specified in this policy.

Legal Reference: Education Code, Sections 35160; 41030; 41031; 41035-41038; 60071-60076

Policy Adopted: 06/1950 (BP 1300)
Policy Amended: 08/1985

Policy Adopted: 10/01/1991 (BP 1320)
Policy Amended: 12/03/1991

Policy Adopted: 12/17/2002 (BP 3290)
Policy Amended: 11/28/2017; --/--/2019

Formerly BP 1300 & BP 1320

Business and Noninstructional Operations

Recovery for Property Loss or Damage

The Board of Education desires to create a safe and secure learning environment and to minimize acts of vandalism and damage to school property. ~~To discourage such acts, the District shall seek reimbursement of damages within the limitations specified in law, from any individual, or from the parent/guardian of any minor, who has committed theft or has willfully damaged District or employee property.~~ When District property is damaged due to the willful misconduct of a student or other person, the District shall seek reimbursement of damages, within the limitations specified in law, from the parent/guardian of a minor child or from any other responsible individual.

The District may collect debt owed by a student or former student as a result of vandalism or to cover the replacement cost of District books, supplies, or property loaned to a student that the student willfully fails to return or that is willfully cut, defaced, or otherwise injured. However, this policy shall not apply to a student who is a current or former homeless or foster child or youth. (Education Code 48904, 49014)

Rewards

~~When District or law enforcement officials have not been able to identify the person(s) responsible for the theft or vandalism of District property, the Board may authorize a reward for the identification and apprehension of the responsible person(s).~~

~~When District or law enforcement officials have not been able to identify the person(s) responsible for vandalism, burglary, or arson resulting in a loss of or damage to District property, or when an assault results in injury to an employee or volunteer, the Superintendent or the Chief Business and Financial Officer is authorized to offer a cash reward to any person other than a District employee, for providing information leading to identification and apprehension of the responsible person(s).~~

The Board may offer and pay a reward for information leading to the determination of the identity of, and the apprehension of, any person who willfully damages or destroys any District property. (Government Code 53069.5)

The Board authorizes the Superintendent or designee to offer a reward in any amount he/she deems appropriate, not exceeding $2,500. A reward in excess of $2,500 shall be authorized in advance by the Board.

~~The cost of any reward paid and any advertising of such reward shall be added to the damage claim against the perpetrator(s).~~

~~The Superintendent or designee shall disburse the reward when the guilt of the person responsible~~

Business and Noninstructional Operations

Recovery for Property Loss or Damage

~~for the act has been established by a criminal conviction or other appropriate judicial procedure.~~

The Superintendent or designee shall disburse the reward when the guilt of the person responsible for the act has been established by a criminal conviction or other appropriate judicial procedure. If more than one person provides information, the reward shall be divided among them as appropriate.

Legal Reference:	Education Code, Sections 19910; 19911; 44810; 48904; 49014 Civil Code, Section 1714.1 Government Code, Sections 53069.5; 53069.6; 54951 Penal Code, Sections 484; 594; 594.1; 640.5; 640.6
Policy Adopted:	10/07/1986
Policy Amended:	07/19/1994; 02/04/2003; 01/16/2018; --/--2019

Formerly BP 3539

DRAFT

Students – Attendance

Interdistrict Attendance

The Board of Education recognizes that parents/guardians of students who reside within the geographic boundaries of one district may, for a variety of reasons, ~~choose~~ desire to enroll their children in a school in another district.

The Board may enter into an agreement with any other school district, for a term not to exceed five school years, for the interdistrict attendance of students who are residents of the districts. (Education Code 46600)

The agreement shall specify the terms and conditions under which interdistrict attendance shall be permitted or denied. It also may contain standards agreed to by both districts for reapplication and/or revocation of the student's permit. (Education Code 46600)

Upon receiving a permit for transfer into the district that has been approved by the student's district of residence, or upon receiving a written request from the parent/guardian of a district student who wishes to enroll in another district, the Superintendent or designee shall review the request and may approve or deny the permit subject to the terms and conditions of the interdistrict attendance agreement.

Transportation

The district shall not provide transportation ~~outside of district boundaries except for those students who have transportation noted in their Individualized Education Plan~~. beyond any school attendance area. Upon request of a student's parent/guardian, the Superintendent or designee may authorize transportation for students who have transportation noted in their Individualized Education Plan (IEP).

Legal Reference: Education Code, Sections 41020; 46600-~~46611~~46610; 48204; 48300-48317; ~~48350-48361;~~ 48900; 48915; 48915.1; 48918; 48980; 48985; 52317
California Constitution, Article 1, Section 31
Attorney General Opinions: 87 Ops.Cal.Atty.Gen. 132 (2004); 84 Ops.Cal.Atty.Gen. 198 (2001)
Court Decisions:
Walnut Valley Unified School District v. the Superior Court of Los Angeles County, (2011) 192 Cal.App.4th 234
Crawford v. Huntington Beach Union High School District, (2002) 98 Cal.App.4th 1275

Students – Attendance

Interdistrict Attendance

Policy Adopted: 12/04/1956

Policy Amended: 12/21/1965; 06/04/1985; 04/07/1992; 05/21/1996; 01/14/2003; 01/18/2011; 09/15/2015; 09/04/2018; --/--/2019

Formerly BP 5154

DRAFT

~~Concepts and Roles in~~ Administration

The Governing Board recognizes that District administration performs essential roles and functions in support of student learning, including the provision of instructional support and services to schools as well as the responsible management of noninstructional operations. The Superintendent or designee may make decisions concerning District operations within the parameters of law and Board policy.

The Superintendent shall provide leadership in developing administrative regulations and organizational structures, decision-making processes, and staff action plans that allow the District to fulfill its vision and goals. The Board also expects the Superintendent to help shape the culture and environment of the District in a manner that focuses District operations on enhancing student achievement, encourages positive relationships within the community, and instills confidence in District schools.

The Board and Superintendent shall work together as a team in the exercise of District governance. The Board and Superintendent shall establish protocols that describe how the governance team will operate, including, but not limited to, agreements regarding Board meeting operations and communications between the Superintendent and the Board.

Because the Superintendent is the only District employee who is directly selected and evaluated by the Board, the Board has a responsibility to ensure that the Superintendent possesses the skills and attributes that best meet the needs of the District.

The Superintendent may delegate to other District staff any duties imposed upon him/her by the Board. This delegation shall not relieve the Superintendent of responsibility for actions taken by his/her designees.

~~The Governing Board expects the administration to promote the creation of the best possible educational program and to maintain an environment conducive to learning. The Superintendent shall provide the vision and educational leadership in this effort and shall give top priority to meeting the needs of all students and actively helping teachers raise academic achievement.~~

~~The Superintendent or designee shall develop decision making processes which are responsive to the school community and to the specific needs of individual students. He/she shall provide means by which staff, students and parents/guardians at each school may participate in decisions related to school improvement and matters which the Board identifies as appropriately managed at the school site level. The administration shall provide professional advice to the Board and to citizen advisory committees.~~

~~Within the parameters of law, the Board may employ administrative and supervisory personnel to assist in the effective management of the District. All schools and departments shall form an administrative system which provides for appropriate decision making at various levels in~~

~~Concepts and Roles in~~ Administration

~~accordance with Board policy and administrative regulations. The Board expects the Superintendent to recognize, develop and use the leadership abilities of staff.~~

~~The Board desires to give all administrators the authority they need in order to carry out their assigned responsibilities. The Board shall clearly state what it expects of the Superintendent and shall evaluate him/her on how well those expectations have been met. In turn, the Superintendent or designee shall clearly state what is expected of all other administrators and shall evaluate how well those expectations have been met.~~

Legal Reference: Education Code, Sections 35020; 35026; 35028; 35029; 35031; 35033; 35034; 35035; 35160; 35160.1; 35161; ~~41401-41407~~

Policy Adopted: 01/15/1985

Policy Amended: 10/07/2003; --/--/2019

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

INFORMATION REPORT NO. 5

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Dr. Mary Mason, Executive Director, Elementary Education
SUBJECT:	**Glendale Community College Elementary Enrichment Summer School Program 2019**

Glendale Community College (GCC) will again partner with the District in a fee-based enrichment summer program for students entering kindergarten through sixth grade. The program will be held at Fremont Elementary School and will run for four weeks, from June 17 through July 12, 2019. Kathy Seifert, Glendale Community College Community Services Education Director, and Vickie Atikian, Fremont Elementary School Principal, are responsible for the coordination of the program.

The Glendale Community College Enrichment Summer School Program will provide enrichment classes in the areas of reading, writing, math, science, art, and cooking. Also offered are Introduction to Kindergarten and Introduction to First Grade classes. Detailed information on the full schedule of classes and hours is available on the GCC website at https://www.glendale.edu/home/showdocument?id=39784 or by calling the Glendale Community College Community Services Education Office at (818) 240-1000, Ext. 5015.

The tuition for each class is $475. Registration is in progress, and will be accepted in person at the Glendale Community College Garfield Campus, Community Services Education Office, located at 1122 E. Garfield Avenue, Room MP 112, Glendale 91205. Online registration is also available at www.glendale.edu/cse.

Childcare services will be offered through the GUSD Early Education and Extended Learning Program (EEELP) Department. For information on the after-school childcare services available at Fremont Elementary School in conjunction with this summer program, contact Christina Painter, Head Teacher, at (818) 430-0773.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

INFORMATION REPORT NO. 6

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

SUBMITTED BY: Stephen Dickinson, Chief Business and Financial Officer

PREPARED BY: Hagop Kassabian, Administrator: Planning, Development & Facilities

SUBJECT: **Update on Measure S and Facility Programs**

This agenda item is in support of Board Priority No. 2 – Create a Culture of Learning. Staff will make a presentation, which will include an update on the following items:

1. Superintendent's Facility Advisory Committee (SFAC)
    - Committee members had no items to approve at April 8 meeting
    - Introduction to new Administrator of Planning & Development – Hagop Kassabian
    - Members received an update on the Board Study Session held on March 26, 2019
2. Items to Discuss
    - Facility Master Plan
    - Hoover High School Pool Expansion and Renovation Project – Additional Options
    - Additional Follow-Up Items
        i. Crescenta Valley High School Pool Renovation Project Cost Estimate
        ii. Permanent Classroom Space at Monte Vista and Glenoaks Elementary Schools

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

INFORMATION REPORT NO. 7

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

SUBMITTED BY: Stephen Dickinson, Chief Business and Financial Officer

PREPARED BY: Hagop Kassabian, Administrator: Planning, Development & Facilities

SUBJECT: **Monte Vista Elementary School Modular Bathroom Project Update**

This agenda item is in support of Board Priority No. 2 – Create a Culture of Learning.

Staff will provide an update to the Board regarding a plan for moving forward with the installation of a 12-foot by 24-foot modular restroom building at Monte Vista Elementary School.

There are currently three potential locations for the restroom building under consideration (see attachment A). The final location is yet to be determined, based on available space, size of building and anticipated DSA requirements. Following a finalized location for the building, staff will have to work with a District approved architectural firm to have plans generated for the project and submitted for approval by the Division of the State Architect. Including design, approval by DSA, and installation of the building, this project is anticipated to take up to 6-12 months to be completed.

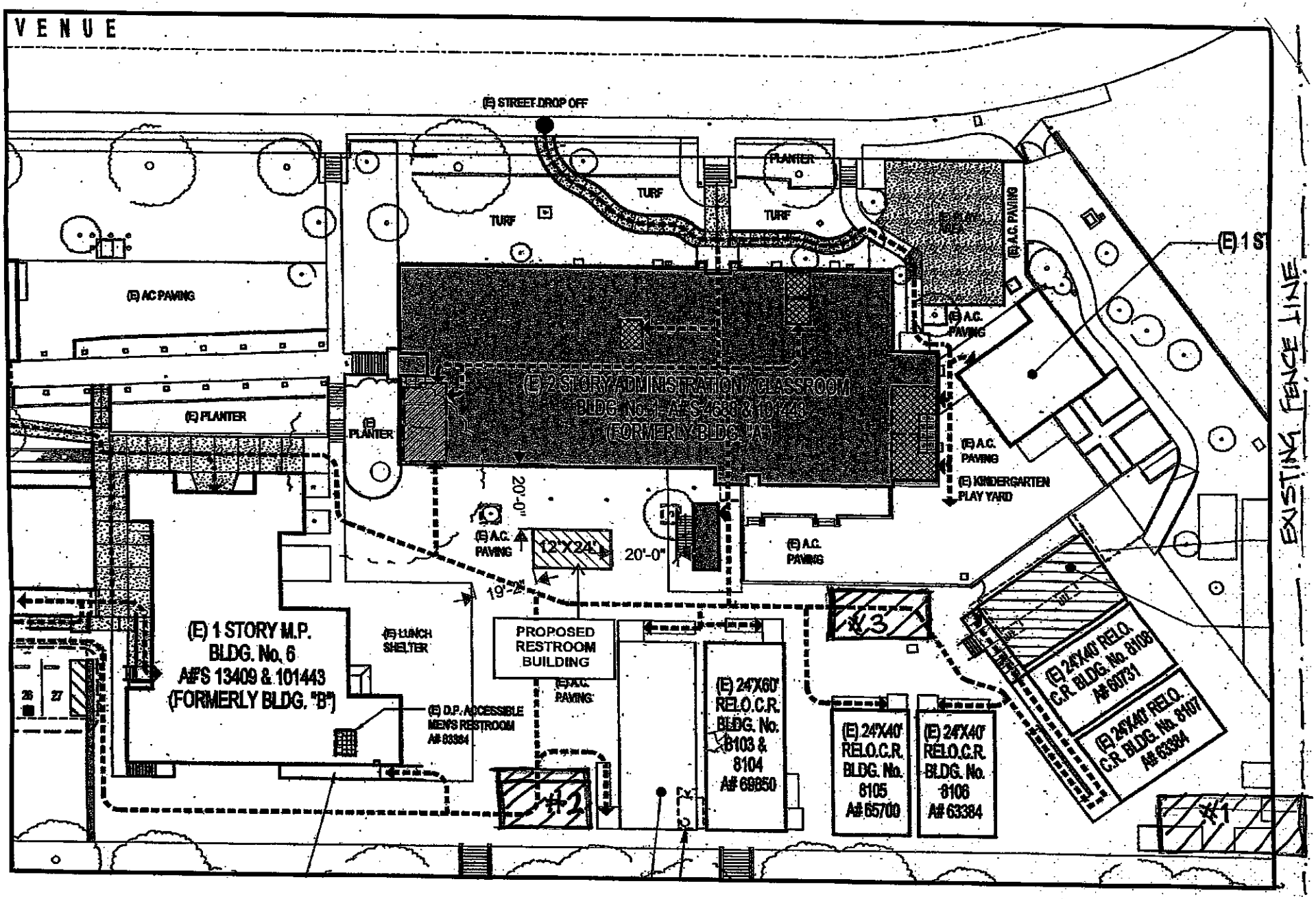
These accommodations will be completed in combination with other changes to the campus, including an $18,000 beautification project of the bungalow area and continuing to move classrooms so grade alike rooms are in close proximity to one another to increase teacher collaboration.

The modular restroom building will be comprised of one toilet, a urinal and a sink in the boys section and two toilets and one sink in the girls section (see Attachment B). Staff has estimated costs for the installation of a modular restroom building to be approximately $205,000-$255,000 to be funded with Developer Fee revenue. The cost estimate consists of:

1. Building costs = $65,000 - $100,000 (depending on the size of the bldg 12'x24' or 24'x40')
2. Site work = $40,000 - $55,000
3. Design fee = $15,000
4. Crane = $10,000
5. Soft costs (geotechnical, materials testing, inspection, engineering, staff time) = $40,000
6. Contingency = $35,000

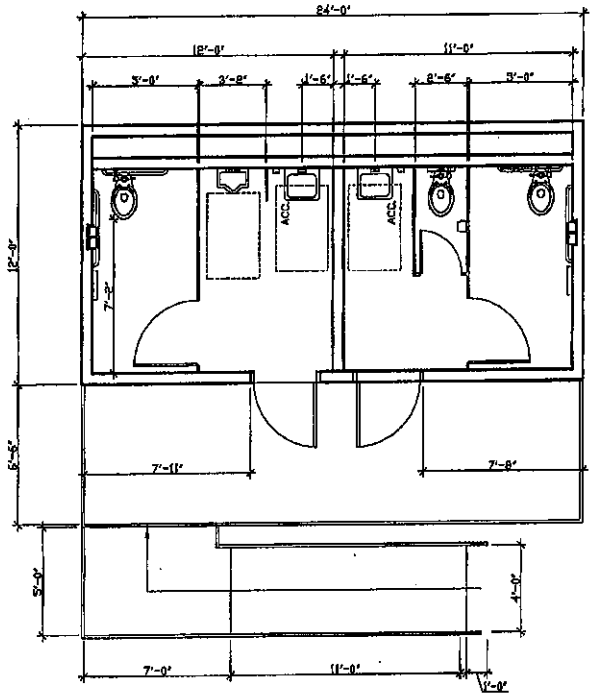
Total = $205,000 - $255,000

Attachment A



MONTE VISTA ELEMENTARY SCHOOL
2620 ORANGE AVE, LA CRESCENTA, CA 91214
GLENDALE UNIFIED SCHOOL DISTRICT

DC | ARCHITECTS
620 N. MOUNTAIN AVE. # 200 UPLAND, CA 91786
(909) 985 - 6939 O / (909) 985 - 0864 F



12' X 24 ' RESTROOM BUILDING FLOOR PLAN

NOT A PC PLAN

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

ACTION REPORT NO. 1

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED IN: Office of the Superintendent

SUBJECT: **Resolution No. 23 - Remembering the Armenian Genocide and Reaffirming a Better World**

The Interim Superintendent recommends that the Board of Education adopt Resolution No. 23 - Remembering the Armenian Genocide and Reaffirming a Better World

As we recall the Armenian Genocide, the Holocaust, and other horrors from the past, the Glendale Unified School District reaffirms its commitment to the teaching of tolerance, understanding, the resolution of problems, and the strength of diversity in our schools and community. These qualities will help instill in today's young generation the optimism and hope for a better world and a stronger America.

Since the 2013/2014 school year, Glendale Unified School District has calendared April 24 as a "student free" day to ensure that a large sector of our students has the opportunity to engage in activities to recognize the Armenian Genocide. We are proud to support the continuation of observing April 24 as "Armenian Genocide Remembrance Day."

GLENDALE UNIFIED SCHOOL DISTRICT
RESOLUTION NO. 23

REMEMBERING THE ARMENIAN GENOCIDE
AND REAFFIRMING A BETTER WORLD

WHEREAS: History contains innumerable examples of people who have contributed actions so positive and of such significance that they changed the course of the world forever; and

WHEREAS: History chronicles events when humankind created unspeakable horrors and acts of degradation. Catastrophic occurrences, which include religious, territorial, and political world wars; the Holocaust; and the Armenian Genocide, are among the acts of man's inhumanity to man, which have placed upon human history some of its darkest hours; and

WHEREAS: At a time when many people in our community recall the horrors of the Armenian Genocide, the Holocaust, and other tragic events, it is important for all of us to be reminded of the consequences of evil and what happens when others fail to prevent it from happening. As Edmund Burke noted more than two centuries ago, "For evil to flourish, it is only necessary for good men to do nothing."

WHEREAS: We recognize the devotion of those who survived and carried on to teach the world about these atrocities with the hope they will never occur again.

WHEREAS: In a city and country with a population so rich and diverse in heritage, it is appropriate to recognize events throughout world history that remind us of the triumphs of humankind. The Americans who through our 200 plus years have sacrificed their lives that all Americans today live in freedom are an excellent example.

NOW, THEREFORE, BE IT RESOLVED that in the spirit of remembrance, the Glendale Unified School District reaffirms its commitment to the teaching of tolerance, understanding, the peaceful resolution of problems, and the strength of diversity in our schools and in our community so that these qualities may help instill in today's young generation the optimism and hope for a better world and strengthen our great nation.

APPROVED and ADOPTED this 16th day of April 2019.

_____
Board President
Glendale Unified School District

I, _____, clerk of the Governing Board of the Glendale Unified School District do hereby certify that the foregoing Resolution was adopted by the Governing Board of the Glendale Unified School District at a meeting held on the 16th day of April 2019 and that it was so adopted by the following vote:

AYES:
NAYS:
ABSTAIN:
ABSENT:

Date: April 16, 2019

_____
Board Clerk
Glendale Unified School District

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

ACTION REPORT NO. 2

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED BY: Stephen Dickinson, Chief Business and Financial Officer

SUBJECT: **Signature Authorizations and Re-adoption of Board Policies**

The Interim Superintendent recommends that the Board of Education adopt Resolutions No. 24, 25, 26, 27, 28, 29, 30, and 31, and approve the signature authorizations and readopt the Board Policies from April 16, 2019 to June 30, 2020.

Resolution No. 24	Authorizing the Interim Superintendent and Secretary to the Board, and the Interim Superintendent's designee to execute documents for the Board
Resolution No. 25	Authorizing certain administrators to sign warrants and checks on various accounts
Resolution No. 26	Authorizing the establishment of a Revolving Cash Fund in the amount of $70,000 and authorizing the Chief Accounting Officer of the District to make expenditures therefrom
Resolution No. 27	Authorizing the Executive Director of Special Education, Director of Special Education, and the Coordinator III of Special Education to sign various Special Education contract documents on behalf of the District
Resolution No. 28	Authorizing certain administrators or designees to have Voucher Approval Rights on the County PeopleSoft System
Resolution No. 29	Readopting Board of Education Policies and Bylaws
Resolution No. 30	Authorizing the Interim Superintendent or his designee to sign for payment of items under $75,000 related to Los Angeles County Office of Education (LACOE) contracts, student teaching, nursing, counseling intern, Special Education transportation, settlement agreements, and field trips without Board approval
Resolution No. 31	Authorizing the Assistant Superintendent, Human Resources to sign employment contracts

RESOLUTION NO. 24

A RESOLUTION OF THE BOARD OF EDUCATION OF THE GLENDALE UNIFIED SCHOOL DISTRICT OF LOS ANGELES COUNTY AUTHORIZING THE INTERIM SUPERINTENDENT AND SECRETARY TO THE BOARD, AND THE INTERIM SUPERINTENDENT'S DESIGNEE TO EXECUTE DOCUMENTS FOR THE BOARD

BE IT RESOLVED, by the Board of Education of the Glendale Unified School District of Los Angeles County, that Dr. Kelly King, Interim Superintendent of Schools and Secretary to the Board, and the Interim Superintendent's Designee (Chief Business and Financial Officer, Assistant Superintendent of Educational Services, and Assistant Superintendent of Human Resources) be authorized to execute in the name of the Board all contracts, documents, papers, and oaths, including service reports, previously authorized and approved by official Board action during the period April 16, 2019 to June 30, 2020.

I HEREBY CERTIFY that the above resolution was approved and adopted by the Board of Education of the Glendale Unified School District at a regular meeting held on the 16th day of April 2019.

BOARD OF EDUCATION
GLENDALE UNIFIED SCHOOL DISTRICT

_____
Clerk, Board of Education

RESOLUTION NO. 25

A RESOLUTION OF THE BOARD OF EDUCATION OF THE GLENDALE UNIFIED SCHOOL DISTRICT OF LOS ANGELES COUNTY AUTHORIZING CERTAIN ADMINISTRATORS OR DESIGNEES TO SIGN WARRANTS

BE IT RESOLVED by the Board of Education of the Glendale Unified School District of Los Angeles County that the following administrators be authorized to sign warrants and checks on various accounts for the Glendale Unified School District during the period April 16, 2019 to June 30, 2020.

Kelly King, Interim Superintendent
and/or

Stephen Dickinson, Chief Business and Financial Officer;
and/or

Karineh Savarani, Director, Financial Services

BE IT RESOLVED FURTHER that only one signature be required on each warrant.

I HEREBY CERTIFY that the above resolution was approved and adopted by the Board of Education of the Glendale Unified School District at a regular meeting held on the 16th day of April 2019.

BOARD OF EDUCATION
GLENDALE UNIFIED SCHOOL DISTRICT

_____
Clerk, Board of Education

RESOLUTION NO. 26

A RESOLUTION OF THE BOARD OF EDUCATION OF THE GLENDALE UNIFIED SCHOOL DISTRICT OF LOS ANGELES COUNTY AUTHORIZING THE ESTABLISHMENT OF A REVOLVING CASH FUND IN THE AMOUNT OF $70,000 AND AUTHORIZING THE CHIEF ACCOUNTING OFFICER OF THE DISTRICT TO MAKE EXPENDITURES THEREFROM

WHEREAS, Section 42800 of the Education Code of the State of California, provides for the establishing of a Revolving Cash Fund by the governing board of any school district for use of the chief accounting officer of such district; and,

WHEREAS, Karineh Savarani is the Chief Accounting Officer of the Glendale Unified School District, and the amount needed for said Revolving Cash Fund is Seventy Thousand Dollars ($70,000), which said sum is not more than two percent (2%) of the District's expenditures for the current fiscal year;

NOW, THEREFORE, BE IT RESOLVED by the Board of Education of the Glendale Unified School District that, in accordance with all provisions of Section 42800 to Section 42805, inclusive, of the Education Code, a Revolving Cash Fund in the sum of Seventy Thousand Dollars ($70,000) be established, and that Karineh Savarani be authorized to make expenditures therefrom for services or material;

BE IT FURTHER RESOLVED that if the County Superintendent of Schools approves the establishment of said Revolving Cash Fund, Karineh Savarani shall be bonded by a Public Employees Honesty Blanket Bond indemnifying the District against loss in accordance with Section 42802 of the Education Code.

It is recommended that the Board accept the following certification:

"I hereby accept responsibility for the Glendale Unified School District Revolving Fund without benefit of audit or closure."

_____
Karineh Savarani, Director, Financial Services

I HEREBY CERTIFY that the above resolution was approved and adopted by the Board of Education of the Glendale Unified School District at a regular meeting held on the 16th day of April 2019.

BOARD OF EDUCATION
GLENDALE UNIFIED SCHOOL DISTRICT

_____
Clerk, Board of Education

RESOLUTION NO. 27

A RESOLUTION OF THE BOARD OF EDUCATION OF THE GLENDALE UNIFIED SCHOOL DISTRICT OF LOS ANGELES COUNTY AUTHORIZING CERTAIN ADMINISTRATORS OR DESIGNEES TO SIGN VARIOUS SPECIAL EDUCATION CONTRACT DOCUMENTS AND AGREEMENTS

BE IT RESOLVED by the Board of Education of the Glendale Unified School District of Los Angeles County that the following administrators be authorized to sign various Special Education contract documents and agreements for the Glendale Unified School District during the period April 16, 2019 to June 30, 2020.

Debra Rinder, Executive Director, Special Education;
and/or

Beatriz Bautista, Director, Special Education
and/or

William Gifford, Coordinator III, Special Education

BE IT REVOLVED FURTHER that only one signature be required on each document.

I HEREBY CERTIFY that the above is a true and exact copy of the resolution approved and adopted by the Board of Education of the Glendale Unified School District at a regular meeting held on the 16th day of April 2019.

BOARD OF EDUCATION
GLENDALE UNIFIED SCHOOL DISTRICT

_____
Clerk, Board of Education

RESOLUTION NO. 28

A RESOLUTION OF THE BOARD OF EDUCATION OF THE GLENDALE UNIFIED SCHOOL DISTRICT OF LOS ANGELES COUNTY AUTHORIZING CERTAIN ADMINISTRATORS TO HAVE VOUCHER APPROVAL RIGHTS ON THE COUNTY PEOPLESOFT SYSTEM

BE IT RESOLVED by the Board of Education of the Glendale Unified School District of Los Angeles County that the following administrators or designees be authorized to approve vouchers for the Glendale Unified School District during the period of April 16, 2019 to June 30, 2020.

Stephen Dickinson, Chief Business and Financial Officer;
and/or

Karineh Savarani, Director, Financial Services
and/or

Designee, Teresa Miras, Accounting Supervisor
and/or

I HEREBY CERTIFY that the above resolution was approved and adopted by the Board of Education of the Glendale Unified School District at a regular meeting held on the 16th day of April 2019.

BOARD OF EDUCATION
GLENDALE UNIFIED SCHOOL DISTRICT

_____
Clerk, Board of Education

RESOLUTION NO. 29

A RESOLUTION OF THE BOARD OF EDUCATION OF THE GLENDALE UNIFIED SCHOOL DISTRICT OF LOS ANGELES COUNTY READOPTING POLICIES AND BYLAWS OF THE BOARD OF EDUCATION FOR THE PERIOD APRIL 16, 2019 TO JUNE 30, 2020

BE IT RESOLVED by the Board of Education of the Glendale Unified School District of Los Angeles County that Policies and Bylaws of the Board of Education of the Glendale Unified School District are reconfirmed for the period of April 16, 2019 to June 30, 2020.

I HEREBY CERTIFY that the above is a true and exact copy of the resolution approved and adopted by the Board of Education of the Glendale Unified School District at a regular meeting held on the 16th day of April 2019.

BOARD OF EDUCATION
GLENDALE UNIFIED SCHOOL DISTRICT

_____
Clerk, Board of Education

RESOLUTION NO. 30

A RESOLUTION OF THE BOARD OF EDUCATION OF THE GLENDALE UNIFIED SCHOOL DISTRICT OF LOS ANGELES COUNTY AUTHORIZING THE INTERIM SUPERINTENDENT OR HER DESIGNEE TO SIGN FOR PAYMENT OF ITEMS UNDER $75,000 WITHOUT BOARD APPROVAL

BE IT RESOLVED, by the Board of Education of the Glendale Unified School District of Los Angeles County, that Dr. Kelly King, Interim Superintendent or her designee be authorized to sign for payment of items under $75,000 related to Los Angeles County Office of Education (LACOE) contracts, student teaching, nursing, counseling intern, Special Education transportation, settlement agreements, and field trips without Board approval during the period of April 16, 2019 to June 30, 2020.

I HEREBY CERTIFY that the above resolution was approved and adopted by the Board of Education of the Glendale Unified School District at a regular meeting held on the 16th day of April 2019.

BOARD OF EDUCATION
GLENDALE UNIFIED SCHOOL DISTRICT

_____
Clerk, Board of Education

RESOLUTION NO. 31

A RESOLUTION OF THE BOARD OF EDUCATION OF THE GLENDALE UNIFIED SCHOOL DISTRICT OF LOS ANGELES COUNTY AUTHORIZING THE ASSISTNAT SUPERINTENDENT, HUMAN RESOURCES TO SIGN EMPLOYMENT CONTRACTS

BE IT RESOLVED, by the Board of Education of the Glendale Unified School District of Los Angeles County, that Dr. Cynthia M. Foley, Assistant Superintendent, Human Resources be authorized to sign employment contracts, previously authorized and approved by official Board action during the period of April 16, 2019 to June 30, 2020.

I HEREBY CERTIFY that the above resolution was approved and adopted by the Board of Education of the Glendale Unified School District at a regular meeting held on the 16th day of May 2019.

BOARD OF EDUCATION
GLENDALE UNIFIED SCHOOL DISTRICT

_____
Clerk, Board of Education

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

ACTION REPORT NO. 3

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
PREPARED IN:	Office of the Superintendent
SUBJECT:	**Appointment of Voting Representative to Elect Members to the County Committee on School District Organization**

The Interim Superintendent recommends that the Board of Education appoint one member as its voting representative to elect members to the Los Angeles County Committee on School District Organization.

The Board of Education may, at its annual organization meeting, appoint one of its members as its voting representative to elect the County Committee on School District Organization. The secretary shall notify the County Superintendent of Schools of the name of the representative selected by the Board. This meeting is normally held in October/November. Board Member Nayiri Nahabedian is the current representative.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

ACTION REPORT NO. 4

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
PREPARED IN:	Office of the Superintendent
SUBJECT:	**Appointment of Board Representative to the Los Angeles County School Trustees Association (LACSTA)**

The Interim Superintendent recommends that the Board of Education designate its voting representative to LACSTA.

Each year, the Board of Education appoints an annual representative to the Los Angeles County School Trustees Association.

The role of the representative is as follows:

- Vote on all Association matters;
- Communicate between the Executive Board, the Association, and the local board; and
- Serve on the legislative committee primarily as a communication link, unless interested in a more active role.

This representative holds a separate position from that of the voting delegate for the annual county committee election. However, the same Board Member may serve in both voting roles. The current representative is Dr. Armina Gharpetian.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

ACTION REPORT NO. 5

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED IN: Office of the Superintendent

SUBJECT: **2019 California School Boards Association (CSBA) Delegate Assembly Run-off Election**

The Interim Superintendent recommends that the Board of Education vote for one candidate for the CSBA Delegate Assembly, Subregion 23-A.

The members of the Delegate Assembly Election Committee met on March 22, 2019 to count and certify the ballots for election to the Delegate Assembly. A tie for a seat on the delegate assembly occurred in Subregion 23-A resulting in the need for a run-off election.

Candidates on the ballot for the run-off election are:

- Jennifer Freemon (Glendale USD)
- Robert "Bob" Gin (Alhambra USD)

The Board is asked to vote for one candidate.

Run-off ballots must be postmarked on or before Tuesday, April 30, 2019. The ballots will be counted on May 6. Should a second tie occur, the Regional Director will cast the tie-breaking vote. Delegates serve two-year terms effective the day the run-off votes are counted through March 31, 2021. The next meeting of the Delegate Assembly is May 18-19 in Sacramento.

REQUIRES BOARD ACTION

RUN-OFF BALLOT

This complete, **ORIGINAL** Ballot must be **SIGNED** by the Superintendent or Board Clerk and returned in the enclosed envelope postmarked by the post office No later than **TUESDAY, APRIL 30, 2019**. Only ONE Ballot per Board. Be sure to mark your vote "**X**" in the box.
A PARTIAL, UNSIGNED, PHOTOCOPIED, OR LATE BALLOT WILL NOT BE VALID.

OFFICIAL 2019 DELEGATE ASSEMBLY BALLOT
SUBREGION 23-A
(Los Angeles County)

Number of vacancies: 1 (Vote for no more than 1 candidate)

Delegates will serve two-year terms beginning May 6, 2019 - March 31, 2021

**denotes incumbent*

☐ Jennifer Freemon (Glendale USD)

☐ Robert "Bob" Gin (Alhambra USD)

_____ _____
Signature of Superintendent or Board Clerk *Title*

_____ _____
School District Name *Date of Board Action*

See reverse side for list of all current Delegates in your Region.

csba
California School Boards Association

2019 Delegate Assembly Candidate Biographical Sketch Form

DUE: Monday, January 7, 2019 – no late submissions accepted

Please complete, sign, and date this required ONE-page candidate biographical sketch form. An optional, ONE-page, single-sided, résumé may also be submitted; both will be copied exactly as received. Please do not state "see résumé" and do not re-type this form. It is the candidate's responsibility to confirm that all nomination materials have been received by the CSBA Executive Office.

Your signature indicates your consent to have your name placed on the ballot and to serve as a Delegate, if elected.

Signature: Jennifer Freemon ***Date:*** 12/19/2018

Name: Jennifer Freemon

CSBA Region & subregion #: 23A

District or COE: Glendale Unified School District

Years on board: 3.5

Profession: Educator

Contact Number (please √ ☒ Cell ☐ Home ☐ Bus.): 8183881251

*Primary E-mail: jfreemon@gusd.net

(**Communications from CSBA will be sent to primary email)*

Are you an incumbent Delegate? ☐ Yes ☒ No | If yes, year you became Delegate:_____

Why are you interested in becoming a Delegate? Please describe the skills and experiences you would bring to the Delegate Assembly. (Character count limit: 700)

I am a passionate public education advocate who is committed to full and fair state funding for public schools. I am interested in becoming a delegate to empower school Boards in their efforts to build and maintain quality public schools at the local level. I am excited to bring several yeaers of public school teacher experience to the delegate assembly. Moreover, I have served as a leader on multiple community organizations, including my role on the Glendale USD Board. Some experiences I bring to the delegate assembly center around budget and charter school challenges, and a variety of community issues around district boundaries and facility improvements bonds.

Please describe your activities and involvement on your local board, community, and/or CSBA. (Character count limit: 700)

My local Board serves 26,000 student and is actively engaged in advocacy on many levels. Together, we passed a $285 million dollar facilities bond. Collectively, we approve and monitor a $290 million dollar annual budget. As a Board member, I am engaged with our staff in the examination of academic programs such as our dual immersion and CTE programs. I serve on various Board apointed subcommittees that strengthen our district. I serve as a Cub Scout leader, school volunteer, and am actively addressing the issue of homelessness in the region. Moreover, I am a CSBA Masters in Governance graduate and regular CSBA AEC attendee.

What do you see as the biggest challenge facing governing boards and how can CSBA help address it? (Character count limit: 700)

The single biggest issue facing governing Boards across the state is funding. School Boards are consistently asked to do more with the same dollars. School Boards are facing STRS/PERS obligations, increased needs for mental health services, rising special education costs, and increased services to meet LCAP goals. CSBA should lead the state in advocating for full and fair state funding. Additionally, CSBA has the ability to work with partner organizations such as CASBO, ACSA, CTA and CSEA to build a unified voice to change the state budget priorities. CSBA is able to help districts connect and share best practices on budget management and meeting the needs of all students.

E-mail: nominations@csba.org, or fax to (916) 371-3407, or US Mail to: CSBA | Attn: Executive Office | 3251 Beacon Blvd., West Sacramento, CA 95691. Please only submit biosketch form via one of these modes only; do not send multiple times. If you have any questions, please contact the Executive Office at (800) 266-3382.

Jennifer Freemon

Vice President, Board of Education
Glendale Unified School District
(818) 388-1251 ▪ jfreemon@gusd.net

Jennifer Freemon was first elected to the Glendale Unified School District Board of Education in 2015. Prior to her election on the board, she served as a middle school teacher and high school coach in the district for several years. She has three children currently attending GUSD schools, one in elementary school, one in middle school, and one in high school.

Ms. Freemon started her career in education after completing her Bachelor of Arts and Master of Arts in Teaching from Occidental College. She began in the Glendale Unified School District teaching middle school social studies. Over the years she taught, she was the head aquatics coach for Hoover High School, coaching and managing the boys and girls swim and water polo programs. She also had the opportunity to lead the AVID program at the middle school.

After teaching in the district, Ms. Freemon moved into children and family ministry. She currently is the Coordinator for Children and Youth at the First United Methodist Church of Glendale. Her duties include program management, curriculum development, and general leadership for all the church programs involving children and youth.

In the community, Ms. Freemon is a Cub Scout leader for Pack 313 and a regular team parent and coach for the various AYSO, Baseball, Track, and Volleyball teams on which her children participate. She is a regular volunteer and organizer for Family Promise, which provides housing and support to displaced families. She is the team leader for the local Sierra Service Project team, who go to areas in need to build and repair homes. Ms. Freemon is also an experienced PTA board member, having served in many roles over the years. She has been the president, treasurer, membership chair, committee chair, legislative chair, and parliamentarian for the elementary school PTA. She has also been the council health and welfare VP, and is currently the parliamentarian for the middle school PTA.

On the School Board, Ms. Freemon has completed her Masters in Governance training. She has served on many district committees including the World Languages Committee, LCAP Committee, Superintendent Facility Advisory Committee, Glendale Educational Foundation board representative, Crescenta Valley Legislative Committee, Glendale Civic Leaders Roundtable, and the Five Star Education Coalition.

csba
California School Boards Association

2019 Delegate Assembly Candidate Biographical Sketch Form

DUE: Monday, January 7, 2019 – no late submissions accepted

Please complete, sign, and date this required ONE-page candidate biographical sketch form. An optional, ONE-page, single-sided, résumé may also be submitted; both will be copied exactly as received. Please do not state "see résumé" and do not re-type this form. It is the candidate's responsibility to confirm that all nomination materials have been received by the CSBA Executive Office.

Your signature indicates your consent to have your name placed on the ballot and to serve as a Delegate, if elected.

Signature: Robert Gin ***Date:*** 12/11/18

Name: Robert "Bob" Gin CSBA Region & subregion #: 23 A

District or COE: Alhambra Unified School District Years on board: 16

Profession: Retired Contact Number (please √ ■ Cell ☐ Home ☐ Bus.): (323) 376-7795

*Primary E-mail: gin_bob@ausd.us

(**Communications from CSBA will be sent to primary email)*

Are you an incumbent Delegate? ☐ Yes ■ No | If yes, year you became Delegate:_____

Why are you interested in becoming a Delegate? Please describe the skills and experiences you would bring to the Delegate Assembly. (Character count limit: 700)

To support CSBA and Public Education agenda to help secure Full and Fair Funding and to assure our school district are providing a equitable education for all students. I have been involved with CSBA since 2005, when I was first elected to Delegate Assembly and since I have served on various committees for CSBA, elected as the API Director-At-Large and served on the Board of Directors for the last 4 years. I have served on my own Board for the last 16 years and focus on student learning, keeping the district financially sound and supported The Gateway Success Program, a nationally recognized program.

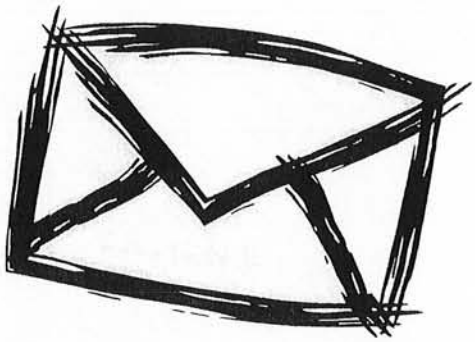
Please describe your activities and involvement on your local board, community, and/or CSBA. (Character count limit: 700)

Community Activities: Alhambra Educational Foundation, Monterey Park Library Foundation, President, Greater Los Angeles Area Coordinating Council, BSA - District Chair and Greater San Gabriel Chinese American Citizens Alliance, Past President.
Local Board: Served as Board President, Vice President and Clerk of the Board. Chaired 3 major bond -$389 million, Liaison to the Los Angeles County School Trustee Association.
California School Board Association: API Director-At-Large & Board of Directors(2014-2018), Finance & Golden Bell Committee(2018), Governance Study Group & Equity Advisory Group(2018), Programmatic Advisory Group, Legislative & Bylaw Committee and Delegate Assembly (2009-2010)

What do you see as the biggest challenge facing governing boards and how can CSBA help address it? (Character count limit: 700)

Funding will always be the biggest challenge that governing boards will face, along with all of the unfunded liabilities, rising health cost every year and the challenge of funding for special education. These are the issues that CSBA can provide continual education and solutions to help make sure every school districts in the State of California stay solvent.

E-mail: nominations@csba.org, or fax to (916) 371-3407, or US Mail to: CSBA | Attn: Executive Office | 3251 Beacon Blvd., West Sacramento, CA 95691. Please only submit biosketch form via one of these modes only; do not send multiple times. If you have any questions, please contact the Executive Office at (800) 266-3382.



- RUN-OFF BALLOTS SHOULD BE RETURNED IN THE ENVELOPE PROVIDED BY CSBA

- IF THE ENCLOSED ENVELOPE IS MISPLACED, PLEASE USE YOUR STATIONERY
- ON THE BOTTOM LEFT CORNER OF THE ENVELOPE, WRITE IN THE REGION OR SUBREGION NUMBER (THIS NUMBER APPEARS ON THE TOP OF THE RUN-OFF BALLOT)

RETURN TO:

CSBA
DELEGATE ASSEMBLY ELECTIONS/Run-Off
3251 BEACON BLVD.
WEST SACRAMENTO, CA 95691

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

ACTION REPORT NO. 6

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

SUBMITTED BY: Stephen Dickinson, Chief Business and Financial Officer

PREPARED BY: Christine Ward, Director, Procurement & Contract Services

SUBJECT: **Award of Bid No. 183-18/19 for the FASO Wall Project**

The Interim Superintendent recommends that the Board of Education award Bid No. 183-18/19 for the FASO Wall Project to Golden Gate Construction in the amount of $272,322.00

This item is in support of Board Priority #2 - Create a Culture of Learning **-** Ensure the safety and support the social, emotional, and physical needs of our students and staff.

Staff worked with the City of Glendale to obtain approval of plans for construction of a wall around the Facility and Support Operations (FASO) maintenance yard. The following is an approximate timeline of the approval process:

- July 18, 2018 – City of Glendale approved a variance to allow construction of the wall
- August 2, 2018 – Plans for construction of the wall submitted to the City for approval
- August 28, 2018-January 8, 2018 – Various revisions were made to the plans at the request of the City
- February 21, 2019 – Plans were approved by the City and ready for construction
- March 19, 2019 – Job walk was conducted for the project
- March 26, 2019 – Revisions were made to the plans as required by GUSD's attorneys

In accordance with established procedures, Procurement & Contract Services completed the solicitation of bids for the FASO Wall Project, Bid No. 183-18/19. A bid conference and job walk was conducted and seven (7) contractors participated. The District received and opened four (4) bids on April 4, 2019, as outlined below:

Contractor	Amount
Golden Gate Construction	$272,322.00
Chalmers Construction Services, Inc.	$316,900.00
Cybertech Construction Company, Inc.	$376,777.00
SS+K Construction, Inc.	$443,000.00

After conducting a post-bid conference and reviewing the bid documents, staff is recommending the award of this project to Golden Gate Construction in the amount of $272,322.00. It is anticipated that this project will to be complete by June 2019.

Bid details are available for review in the Procurement & Contract Services Department. This project will be funded by the Unrestricted General Fund (Fund 01), of which $200,000 had been previously set aside or Designated for this purpose.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 1

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED IN: Office of the Superintendent

SUBJECT: **Minutes**

The Superintendent recommends that the Board of Education approve the Minutes, as listed:

a) Regular Meeting No. 26, April 2, 2019
b) Special Meeting No. 27, April 9, 2019

GLENDALE UNIFIED SCHOOL DISTRICT
223 N. Jackson Street
Glendale, California 91206-4380

BOARD OF EDUCATION MEETING NO. 26
UNADOPTED MINUTES
REGULAR MEETING, April 2, 2019

CALL TO ORDER AND ROLL CALL

The regular meeting of the Glendale Unified School District Board of Education was called to order by Greg Krikorian, president of the Board of Education, at 4:38 p.m. on Tuesday, April 2, 2019, in the Board Room at the Administration Center, 223 N. Jackson Street, Glendale, California. The following members were present for roll call: Jennifer Freemon, Dr. Armina Gharpetian, Shant Sahakian, and Greg Krikorian. Nayiri Nahabedian was not present for roll call; she arrived at 6 p.m.

The following administrators were present: Dr. Kelly King, Mr. Stephen Dickinson, Dr. Cynthia Foley, Dr. Mary Mason, Mr. Felix Melendez, and Dr. Deb Rinder.

PLEDGE OF ALLEGIANCE

Arianna Dominguez, a 4th grade student from Edison Elementary School, led the Pledge of Allegiance.

CERTIFICATE OF COMPLIANCE

Mr. Krikorian read the following statement: "To accommodate the requirements of Government Code §54954.2 and in accordance with the Brown Act revisions, I declare that the agenda for this meeting was posted on the bulletin boards in the lobby of the Administration Center and the GUSD website 72 hours prior to this meeting."

APPROVAL OF AGENDA ORDER

A motion was made by Dr. Gharpetian and seconded by Mr. Sahakian to approve the agenda order, as presented. Motion approved by the following vote: AYES—Freemon, Gharpetian, Sahakian, and Krikorian. ABSENT—Nahabedian.

PRESENTATION

1. 47th Annual Masonic Employee Recognition Awards

   Members of the Glendale and La Crescenta Masonic Lodges presented the Masonic Employee Recognition Awards. This is the 47th annual presentation of these recognition awards to outstanding district employees. This presentation is scheduled as an activity of Public Schools Month, which was founded in 1920 by the Grand Lodge of Free and Accepted Masons of California to celebrate the contribution of public schools to the American Way of Life.

MINUTES: April 2, 2019 – Regular Board Meeting

PUBLIC COMMUNICATION

1. Taline Arsenian, GTA president, congratulated our Masonic awards winners and Mr. Sahakian on the birth of his daughter, Lori. She spoke on the decision to reduce the average class size per school site in grades TK-3 to 24:1. This reduction will provide a financial boost to our district. The state of California provides additional class size reduction revenue for school districts that maintain a 24:1 ratio in grades TK-3. GUSD will receive approximately $6 million in class size reduction revenue. They also hope the California Schools and Local Communities Funding Act passes. It will restore over $11 billion a year to California's schools. She thanked the Board again and looks forward to negotiations.

2. Monna Johnson, Glendale Council PTA president, said she is here today to join in the celebration of a victory that was achieved at the GTA-GUSD negotiations table that is being celebrated districtwide. On March 6, the GUSD Office of Public Information announced to all district stakeholders that the average class size per school site in grades TK-3 will drop to the state average of 24:1 beginning in the 2019-2020 school year. They applaud the School Board for hearing the concerns of teachers, parents and most importantly our youngest children. It is the hope of the Glendale Council PTA that this will be the start of continued conversation regarding class size reduction in all grade levels.

3. Dr. Rebeca Andrade, Glendale Schools Management Association (GSMA) Board member and representing 147 employees, said on Monday, GSMA members will be in Sacramento as part of ACSA Legislative Day. The legislative platform of GSMA revolves around three guiding principles: access, equity, and local control. They support policies that prepare students for success, policies that result in equitable educational outcomes, and policies that empower school leaders to make local decisions that best serve students. There are three bills they are advocating for on Monday: AB 39, which establishes new higher LCFF base rate targets; AB 428, which increases funding for special education; and mental health legislation.

STUDENT BOARD MEMBER REPORT

Student Board Member Sophia James spoke about activities at various schools. CVHS will be hosting the Special Olympics on April 13. This weekend, the Armenian Club students will be attending the 3rd Annual Youth Leadership and Civic Engagement Retreat. On April 17, 2019, the 18th Annual Armenian Genocide Commemoration will be held at Glendale High School auditorium at 7 p.m. It is open to the public. The Robotics Tournament is this Saturday at 10 a.m., and the Middle School Honors Orchestra Concert is Saturday at 7 p.m. She presented a video highlighting the Glendale High School spring rally.

INFORMATION

1. Acknowledgements of Service

2. California Next Generation Science Standards Implementation Update – High School

INFORMATION (Continued)

3. Proposed New Course of Study Outlines for Use in High Schools in the Areas of Career Technical Education and Visual and Performing Arts

4. Proposed New and Revised Course of Study Outlines for Use in Middle and High Schools in the Area of Mathematics

5. Proposed New and Revised Board Policies Relating to Personnel, Instruction, and Administration

6. Board of Education Annual Organization Meeting

The above reports were presented for information and discussion only; no action was taken.

CLOSED SESSION

The Board recessed to Closed Session at 5:50 p.m. to discuss the following:

1. Instructing designated representative, Dr. Kelly King, Interim Superintendent of Schools, regarding collective bargaining matters pursuant to Government Code §54957.6

2. Personnel matters relating to the appointment, employment or evaluation of school based and non-school based district management positions pursuant to Government Code §54957.

3. Personnel matters relating to the discipline, dismissal and release of school-based employees pursuant to Government Code §54957.

4. Conference with Legal Counsel – Anticipated Litigation – Initiation of litigation pursuant to Government Code §54956.9(c): Two potential cases.

5. Public Employment - Government Code §54957
Title: Superintendent of Schools

CALL TO ORDER/RETURN TO REGULAR MEETING

The meeting reconvened at 7:25 p.m.

REPORTING OUT OF CLOSED SESSION

None.

PUBLIC COMMUNICATIONS

No one addressed the Board at this time.

MINUTES: April 2, 2019 – Regular Board Meeting

ACTION REPORTS

1. Award of Bid No. 180-18/19 for the Roosevelt Middle School Walk-in Freezer

   It was moved by Mr. Sahakian and seconded by Mrs. Freemon to approve Action Report No. 1, as recommended. Motion approved by the following vote: AYES— Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

2. Approve List of Prequalified Contractors from which Request for Proposal on Lease-Leaseback Projects May be Solicited

   It was moved by Mrs. Freemon and seconded by Ms. Nahabedian to approve Action Report No. 2, as recommended. Motion approved by the following roll-call vote: AYES— Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

3. Resolution No. 22 for Utilization of the Informal Bidding under the California Uniform Public Construction Cost Accounting Act (CUPCCAA) for New Construction, Maintenance, and Repairs

   It was moved by Mrs. Freemon and seconded by Ms. Nahabedian to approve Action Report No. 3, as recommended. Motion approved by the following roll-call vote: AYES— Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

4. Approval of Budget Adjustment for the Hoover High School Pool Expansion and Renovation Project
   (THIS ITEM WAS NOT VOTED ON – POSTPONED INDEFINITELY.)
   It was moved by Mrs. Freemon and seconded by Mr. Sahakian to postpone this item indefinitely. Motion approved by the following vote: AYES— Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

5. Approval of Project Authorization No. 23 with NAC Architecture for Architectural Services at Hoover High School Pool Expansion and Renovation Project
   (THIS ITEM WAS NOT VOTED ON – POSTPONED INDEFINITELY.)
   It was moved by Mrs. Freemon and seconded by Mr. Sahakian to postpone this item indefinitely. Motion approved by the following vote: AYES— Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

6. Resolution No. 21 – Opposing the Proposed Transfer of Territory to the La Cañada Unified School District

   It was moved by Dr. Gharpetian and seconded by Mr. Sahakian to approve Action Report No. 6, as recommended. Motion approved by the following roll-call vote: AYES—Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

7. Board of Education Meeting Schedule 2019-2020

   It was moved by Mrs. Freemon and seconded by Mr. Sahakian to approve Action Report No. 7, as recommended. Motion approved by the following vote: AYES— Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

ACTION REPORT (Continued)

8. Approval of Secondary Standards-Aligned English Language Arts/English Language Development Instructional Materials Adoption

   It was moved by Dr. Gharpetian and seconded by Ms. Nahabedian to approve Action Report No. 8, as recommended. Motion approved by the following vote: AYES—Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

CONSENT CALENDAR

1. Minutes
   a) Regular Meeting No. 24, March 12, 2019
   b) Special Meeting No. 25, March 26, 2019

2. Certificated Personnel Report No. 15

3. Classified Personnel Report No. 14

4. Warrants totaling $3,113,610.39 for March 6, 2019 through March 27, 2019.

5. Purchase Orders totaling $3,445,109.98 for the period of February 25, 2019 through March 15, 2019

6. Appropriation Transfer and Budget Revision Report

7. Approval of Extension of Contract for Fire Extinguisher Inspection

8. Consolidated Programs School Plans for Student Achievement (SPSAs) Addendum

9. Approval of Supplementary Textbook for Use in High Schools in the Area of English

10. Approval of New Course of Study Outlines for Use in Middle and High Schools in the Areas of Career Technical Education and Visual and Performing Arts

11. Approval of New, Revised, or Retired Board Policies Relating to Students and Instruction

12. Acceptance of DonorsChoose Awards

13. Agreement with Pepperdine University

14. Acceptance of Every Kid Counts College Savings Account Grant

15. Acceptance of Gifts

   It was moved by Ms. Nahabedian and seconded by Dr. Gharpetian to approve the Consent Calendar, as presented. Motion approved unanimously. AYES—Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

MINUTES: April 2, 2019 – Regular Board Meeting

REPORTS FROM THE BOARD

Mr. Sahakian dedicated his report to his newborn daughter, Lori Sidney Sahakian, born on March 21, 2019. His wife is a super hero. They are very excited for their new addition to the family. He thanked the Board and staff for their support.

Mrs. Freemon had a great time at the CV Chamber Smart-a-thon. She thanked Mary Pinola for supporting our schools. If you are looking for things to do this weekend, the Middle Schools Honor Band and Orchestra Concert is on Saturday, 7 p.m. at Glendale High, the Elementary Robotics Tournament is on Saturday morning at Roosevelt, and the Brand Classroom Showcase exhibiting our students' artwork opens this Saturday at the Brand Library. There are plenty things to see highlighting our students.

Dr. Gharpetian congratulated all of our Masonic Awardees. This Thursday is Glendale High School Open House. She invited parents and students to see the great things happening at Glendale High School. She and Mr. Sahakian will be in the main quad to talk with parents and students. Final judging for the "I Love My Neighborhood" poster contest took place. The awards ceremony will be on April 25. The GUSD Armenian Genocide Commemoration will be held on April 17 at the Glendale High School auditorium. It is open to the public and free of charge. Our students have worked hard to put this program together. She is the program director. Everyone is invited.

Ms. Nahabedian said Didi Hirsch and the LA County Department of Mental Health are hosting its 2nd Annual Armenian Genocide event. They are trying to focus on the healing aspect of the Genocide. Yesterday was Cesar Chavez Day. She wants to make sure that some sort of curriculum is being taught around the holiday at all of our schools. She congratulated the Masonic awardees. It is a special type of award as our employees are nominated amongst themselves. She was in Sacramento today as the Assembly Higher Education Committee heard Assembly Bill 15, which would create a universal savings account, under ScholarShare, for all California newborns. The Governor is very much in support of this bill and knows the positive impact it will have. AB 15 now goes to the Appropriations Committee. Also related, is the Consent Item that the Board just approved accepting the "Every kid counts college savings account" grant for almost $200,000. A year ago, we had $10,000 from GEF, establishing 100 accounts for students. Now, we have a grant from the state that can only be used for saving accounts. We are going to focus on first graders.

Mr. Krikorian reiterated that Board members Shant Sahakian and Dr. Armina Gharpetian will be at the Glendale High School Open House to speak with parents. He thanked all the District and community members for taking the time to meet with our search consultants and for taking the time to complete the survey. Hiring the superintendent is the Board's most important work. He is hopeful that potential superintendents will watch our meetings and apply for the position. At the April 16 Board meeting, the HYA consultants will give an update on the leadership qualities developed from the stakeholder meetings and survey. This weekend, he is going to the Youth Leadership and Civic Engagement retreat with the Armenian Club students. He thanked Dr. Gharpetian and Mr. Sahakian for helping him with the 18th

REPORTS FROM THE BOARD (Continued)

Annual Armenian Genocide Commemoration program. He thanked Dr. King for her help through the transition.

REPORT FROM THE INTERIM SUPERINTENDENT

Dr. Kelly King said we have much to be proud of in GUSD. On Friday, we will be celebrating our three California Distinguished Schools: Clark Magnet High, Crescenta Valley High, and Rosemont Middle. Clark Magnet High and CVHS also received exemplary program awards. CVHS is the only high school in the state to receive two exemplary program awards. They will also be celebrating Daily High as a Model Continuation High school at this event at well. She thanked what our staff is doing through tough times. We had a loss of a beloved teacher at Verdugo Woodlands and a beloved classified employee at Glendale High. She thanked everyone for rallying around each other during these difficult times taking care of the students. She could not be prouder of how everyone has responded. She especially thanked the counselors and psychologists for helping others to process grief.

ADJOURNMENT

There being no further business, President Krikorian adjourned the meeting in memory of Barbara Dickmann, fifth grade teacher at Verdugo Woodlands Elementary, and Sandra Mendoza-Mungia, clerk at Glendale High at 7:56 p.m.

Gregory S. Krikorian	Dr. Armina Gharpetian
President, Board of Education	Clerk, Board of Education

Board of Education Minutes - Regular Meeting, April 2, 2019
Recorded by: Ms. Phyllis F. Ishisaka, Executive Assistant to the Superintendent
Approved by the Board of Education:

GLENDALE UNIFIED SCHOOL DISTRICT
223 N. Jackson Street
Glendale, California 91206-4380

BOARD OF EDUCATION MEETING NO. 27
UNADOPTED MINUTES
SPECIAL MEETING, April 9, 2019

CALL TO ORDER AND ROLL CALL

The special meeting of the Glendale Unified School District Board of Education was called to order by President Greg Krikorian at 5:35 p.m. on Tuesday, April 9, 2019, in room 402, of the Administration Center, 223 North Jackson Street, Glendale, California. The following members were present for roll call: Jennifer Freemon, Dr. Armina Gharpetian, Nayiri Nahabedian, Shant Sahakian, and Greg Krikorian.

PLEDGE OF ALLEGIANCE

Mr. Krikorian led the Pledge of Allegiance.

CERTIFICATE OF COMPLIANCE

Mr. Krikorian read the following statement: "To accommodate the requirements of Government Code Section 54954.2 and in accordance with the Brown Act revisions, I declare that the agenda for the meeting was posted on the bulletin board in the lobby of the Administration Center and the GUSD website 24 hours prior to this meeting."

APPROVAL OF THE AGENDA ORDER

Motion to approve the agenda order, as presented, was made by Mrs. Freemon and seconded by Dr. Gharpetian. Motion approved unanimously. AYES—Freemon, Gharpetian, Nahabedian, Sahakian, and Krikorian.

PUBLIC COMMUNICATION

No one addressed the Board at this time.

CLOSED SESSION

The Board recessed to Closed Session at 5:37 p.m. to discuss the following:

1. Public Employment - Government Code §54957
   Title: Superintendent of Schools

MINUTES: April 9, 2019 – Special Board Meeting

RETURN TO REGULAR MEETING

The meeting reconvened at 6:33 p.m.

REPORTING OUT OF CLOSED SESSION

None.

ADJOURNMENT

There being no further business, Mr. Krikorian adjourned the meeting at 6:33 p.m.

Gregory S. Krikorian President, Board of Education	Dr. Armina Gharpetian Clerk, Board of Education

Board of Education Minutes – Special Meeting, April 9, 2019
Recorded by: Ms. Phyllis Ishisaka, Executive Assistant to the Superintendent
Approved by the Board of Education:

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CERTIFICATED PERSONNEL REPORT NO. 16

CONSENT CALENDAR NO. 2

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED BY: Dr. Cynthia M. Foley, Assistant Superintendent, Human Resources/Director of Classified Personnel

SUBJECT: CERTIFICATED PERSONNEL REPORT NO. 16

It is recommended that the following report be approved as presented:

		Position	Effective Dates And Salary Rate
Deceased			
1.	Diekmann, Barbara	Teacher, Regular 5th Grade Verdugo Woodlands Elementary	3/29/19
Maternity Leave of Absence			
1.	Salmassi-Arakelian, Talma	Psychologist Special Education	5/17/19 through 7/14/19
Extension of Maternity Leave of Absence			
1.	Rivera-Elekes, Vanessa	Teacher, Special Education 3rd/4th Grade SAI-SC Columbus Elementary	3/03/19 through 4/16/19
Parental Leave of Absence			
1.	Anderson, Patricia	Teacher Specialist Muir Elementary	4/23/19 through 6/11/19
2.	Rivera-Elekes, Vanessa	Teacher, Special Education 3rd/4th Grade SAI-SC Columbus Elementary	4/17/19 through 5/03/19

		Position	Effective Dates And Salary Rate
Health Leave of Absence			
1.	Sharpe, Michael	Teacher, Temp Contract ROTC Crescenta Valley High School	4/06/19 through 6/06/19
Extension of Health Leave of Absence			
1.	Cicekci, Jibid	Psychologist Special Education	2/26/19 through 4/21/19
2.	Grafius, Jennifer	Teacher, Temp Contract Early Education Pacific/Edison Preschool	1/14/19 through 4/01/19
Family & Medical Leave of Absence			
1.	Danlag, Melinda	Nurse Student Services	4/10/19 through 4/25/19
2.	Doctorian, Nora	Teacher Specialist Marshall Elementary	3/25/19 through 4/05/19
3.	Sharpe, Michael	Teacher, Temp Contract ROTC Crescenta Valley High School	4/06/19 through 6/06/19
Extension of Family & Medical Leave of Absence			
1.	Cicekci, Jibid	Psychologist Special Education	2/26/19 through 4/21/19
2.	Grafius, Jennifer	Teacher, Temp Contract Early Education Pacific/Edison Preschool	1/14/19 through 4/01/19
3.	Rivera-Elekes, Vanessa	Teacher, Special Education 3rd/4th Grade SAI-SC Columbus Elementary	3/03/19 through 5/03/19

		Position	Effective Dates And Salary Rate
General Purpose Leave of Absence			
1.	Widaman, Jennifer	Counselor Glendale High School	8/05/19 through 6/18/20
Military Leave of Absence			
1.	Scates, David	Teacher, Regular Health/Physical Education Hoover High School	4/29/19 through 5/10/19
Opportunity Leave of Absence			
1.	Gonzalez, Francisco	Teacher, Regular History/Math/Science Wilson Middle School	8/19/19 through 6/11/20
Additional Assignment			
1.	Besoli, Amy	Teacher, as needed, to work outside of her contractual dates for preparation of IDS Teaching & Learning	7/01/18 through 6/30/19 Daily substitute rate of pay Not to exceed 2 days 01.0 07405.0 11100 10000 1130 0000618
2.	Lim, Jessie	Teacher, as needed, to translate instructional materials to Korean Teaching & Learning	7/01/18 through 6/30/19 $27.00 per hour Not to exceed 100 hours 01.0 07405.0 11100 10000 1130 0000618
3.	Scott, Jaclyn	Principal, as needed, to oversee the Elementary Physical Education Program Educational Services	7/01/19 through 6/30/20 Daily rate of pay Not to exceed 5 days 01.0 00000.0 00000 27004 1331 390000

		Position	Effective Dates And Salary Rate
Election Hourly/Daily			
1.	Esraelian, Krestena Sanchez, Gladis	Head Teachers, as needed, for Early Education & Extended Learning Programs	4/03/19 through 6/30/19 Hourly rate of pay Not to exceed 100 hours Child Development Activities 12.0 50251.0 85000 10000 1130 0000671 Child Development Activities 12.0 61051.0 85000 10000 1130 0000671 Self-Supporting Daycare 01.0 91400.0 85000 10000 1130 0000671 State Preschool 12.0 61050.0 85000 10000 1130 0000671 California State Preschool 12.0 61052.0 85000 10000 1130 0000671 Recreation After School Program 01.0 91100.0 85000 10000 1130 0000671 Self-Supporting Combined 01.0 91500.0 85000 10000 1130 0000671 Self-Support Preschool 01.0 91300.0 85000 10000 1130 0000671 After School Education & Safety 01.0 60100.0 11100 10000 1130 0000671

		Position	Effective Dates And Salary Rate
Election Hourly/Daily (Cont.)			
2.	Esraelian, Krestena Sanchez, Gladis	Head Teachers, as needed, for Early Education & Extended Learning Programs	4/02/19 through 6/30/19 $30.00 per hour Not to exceed $2,130.00 each After School Education & Safety 01.0 60100.0 11100 10000 5210 25000000 Recreational After School Program 01.0 91100.0 85000 10000 1130 0000671
3.	Esraelian, Krestena Sanchez, Gladis	Head Teachers, as needed, for Early Education & Extended Learning Programs	4/03/19 through 6/30/19 $30.00 per hour Not to exceed 100 hours Child Development Activities 12.0 50251.0 85000 10000 1130 0000671 Child Development Activities 12.0 61051.0 85000 10000 1130 0000671 Self-Supporting Daycare 01.0 91400.0 85000 10000 1130 0000671 State Preschool 12.0 61050.0 85000 10000 1130 0000671 California State Preschool 12.0 61052.0 85000 10000 1130 0000671 Recreation After School Program 01.0 91100.0 85000 10000 1130 0000671 Self-Supporting Combined 01.0 91500.0 85000 10000 1130 0000671 Self-Support Preschool 01.0 91300.0 85000 10000 1130 0000671 After School Education & Safety 01.0 60100.0 11100 10000 1130 0000671

		Position	Effective Dates And Salary Rate
Election Hourly/Daily (Cont.)			
4.	Bagdasaryan, Aylen Cicekci, Jibid J. Haddadian, Fimi Miller, Corinna L.	School Psychologists, as needed, to work for Special Education	2/01/19 through 6/30/19 Daily rate of pay No to exceed 20 days each Special Education Support Services 01.0 65000.0 50011 31200 1233 0000600
5.	Diep, Matthew Lowe, Alexander Underwood, Vince	Substitute teachers, as needed	4/08/19 through 7/15/19 $165.00 per day 01.0 00000.0 19004 10000 1160 0004615
6.	Glusovich, Kelly	Teacher, as needed, for curriculum writing and professional development Career & Technical Education	7/01/18 through 6/30/19 $27.00 per hour Not to exceed 50 hours CTEIG 01.0 09635.0 38000 10000 1130 0000684
7.	Torres, Ana	Teacher, as needed, to assess language fluency of students applying for dual immersion in Spanish at Muir Elementary School	3/28/19 through 5/31/19 $30.00 per hour Not to exceed 5 hours total FLAG Support Program 01.0 00000.0 00000 21004 1130 0008682
Transportation Authorization			
1.	Mandjikian, Houry McLeod, Amber	Consulting teachers, as needed, to travel to provide peer assistance to permanent teacher in the PAR program Teaching & Learning/ Induction Program	7/01/18 through 6/30/19 58 cents per mile Mileage reimbursement 01.0 07405.0 11100 10000 5210 0000618

		Position	Effective Dates And Salary Rate
Transportation Authorization (Cont.)			
2.	Esraelian, Krestena Sanchez, Gladis	Mileage authorization for Early Education & Extended Learning Programs	4/02/19 through 6/30/19 58 cents per mile Child Development Activities 12.0 61051.0 85000 10000 5210 0000671 After School Education & Safety 01.0 60100.0 11100 10000 5210 0000671 California State Preschool 12.0 61052.0 85000 10000 5210 0000671 Self-Supporting Daycare 01.0 91400.0 85000 10000 5210 0000671 Self-Supporting Combined 01.0 91500.0 85000 10000 5210 0000671
3.	Grabowski, Monika	Foster & Homeless Youth Counselor, as needed Educational Services	7/01/18 through 6/30/19 54.5 cents per mile (2018) 58 cents per mile (2019) Child Welfare and Attendance 01.0 05641.0 11100 10000 5210 0000617
Revision to Previous Personnel Report			
1.	Revision to Board Report No. 9, November 26, 2018		
	Page 22, Item 1 Bennett, Patricia	Consultant, as needed, to translate instructional materials to French Teaching & Learning	7/01/18 through 6/30/19 $27.00 per hour Not to exceed 50 hours 01.0 07405.0 11100 10000 5811 0000618
	Change to read:	Consultant, as needed, to translate instructional materials to Spanish	

	Position	Effective Dates And Salary Rate

Revision to Previous Personnel Report (Cont.)

2. Revision to Board Report No. 12, February 5, 2019

Page 22, Item 56

Orrantia, Joseph	Teacher, Regular Tech Literacy Clark Magnet High School	3/26/19 through 6/11/19 One additional hour assignment at 1/5 daily rate of pay according to placement on Regular Teachers Salary Schedule 01.0 00000.0 11303 10000 1100 0900000
Change account number to read:		01.0 00000.0 11303 10000 1110 0900000

3. Revision to Board Report No. 12, February 5, 2019

Page 13, Item 12

Bishop, Joshua	Teacher, Regular Tech Literacy Clark Magnet High School	1/07/19 through 3/15/19 One additional hour assignment at 1/5 daily rate of pay according to placement on Regular Teachers Salary Schedule 01.0 00000.0 11303 10000 1100 0900000
Change account number to read:		01.0 00000.0 11303 10000 1110 0900000

4. Revision to Board Report No. 7, October 16, 2018

Page 14, Item 20

Various names	Teachers, as needed, for planning at Clark Magnet High School	8/22/18 through 6/12/19 $27.00 per hour to plan Not to exceed $2,500.00 total Supplemental 01.0 30100.0 11100 10000 1130 0900000
Increase amount to read:		Not to exceed $8,000.00 total

		Position	Effective Dates And Salary Rate
Revision to Previous Personnel Report (Cont.)			
5.	Revision to Board Report No. 7, October 16, 2018		
	Page 14, Item 21		
	Various names	Teachers, as needed, to work with students with instructional focus on literacy Clark Magnet High School	8/22/18 through 6/12/19 $30.00 per hour to work with students Not to exceed $3,500.00 total Title I 01.0 30100.0 11100 10000 1130 0900000
	Increase amount to read:		Not to exceed $8,753.00 total
Personal Services Agreement			
1.	Avagyan, Dr. Marine	Consultant, as needed, to coach, plan and provide professional development to administrator and administrative staff of Chamlian Private School Categorical Office	5/30/19 through 6/30/19 Not to exceed $800.00 total Title II – Improving Teacher Quality 01.0 40352.0 11100 10000 5811 0000673
2.	Chakerian, Aline Karine	Consultant, as needed, to provide assessments and individual counseling services to Special Education students	4/03/19 through 6/30/19 $95.00 per hour 8 hours per week Not to exceed $15,000.00 Special Education 01.0 65120.0 50011 21000 5811 0000600

		Position	Effective Dates And Salary Rate
Personal Services Agreement (Cont.)			
3.	Chitilian Kalachian, Nora	Consultant, as needed, to train First Steps Private School staff to support student achievement for all learners by behavior management, using positive reinforcement techniques and how to identify student needs.	3/12/19 through 6/30/19 Not to exceed $150.00 total Title II Program 01.0 40352.0 11100 10000 5811 0000673
4.	Merrick, Joann	Consultant, as needed, to provide professional development training to teachers at Clark Magnet High School	3/25/19 Not to exceed $1,000.00 total Supplemental 01.0 010000.0 11100 10000 5811 0900000
5.	Tourville, Lindsay	Consultant, as needed, to provide counseling services based on student's IEP or 504 plan; consultation and collaboration with District staff; complete case disposition; participate in IEP meetings; attend case consultation meetings and submit LEA Medi-Cal billing via Paradigm on a monthly basis. Special Education	4/30/19 through 6/30/19 $60.00 per hour Up to 13 hours/week Not to exceed $4,000.00 01.0 65120.0 50011 21000 5811 0000600

Position	Effective Dates And Salary Rate

Conference/Workshop/Meeting Authorization

In accordance with Board of Education Policy 4011 pertaining to conference and workshop attendance, approval has been given to the following persons to attend the conference as designated, with reimbursement for actual and necessary expenses in accordance with Board Policy:

A. The following workshop authorizations are not paid from District General Funds:

1. It is recommended that approval be given to Jacob Drew, Foothill SELPA Community Advisory Committee Parent, and Dr. Armond Aghakhanian, Board Member, Burbank Unified School District, to attend State SELPA Administrators' Organization Legislative Action Day on May 1, 2019, to be held in Sacramento, California, with all necessary expenses, including registration fee, travel and food, to be paid, not to exceed $1,500.00.

SELPA Regionalized Services
01.0 65001.0 50500 22000 5220 0000668

2. It is recommended that approval be given to Sandra Garcia to attend the "2019 Civil War Institute" to be held at Gettysburg College, Gettysburg, Pennsylvania from June 14-19, 2019. Ms. Garcia was one of four teachers nationwide to win scholarship for this event, with all expenses paid except for air fare. Cost of the air fare not to exceed $500.00.

Title I
01.0 30100.0 11100 10000 5220 0500000

3. It is recommended that approval be given to Katrine Ebrahimian, First Steps Private School teacher, to attend "Play Therapy Attachment-Based Treatment Interventions for Trauma, Anxiety, OCD and More!" conference to be held at Sheraton Pasadena (303 E. Cordova St., Pasadena, CA 91101) on 5/10/19. Registration fee not to exceed $199.99.

Title II
01.0 40352.0 11100 10000 5220 0000673

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CLASSIFIED PERSONNEL REPORT NO. 15

CONSENT CALENDAR NO. 3

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED BY: Dr. Cynthia M. Foley, Assistant Superintendent, Human Resources

SUBJECT: CLASSIFIED PERSONNEL REPORT NO. 15

It is recommended that the following report be approved as presented:

	Location	Months/Hours, and Salary Rating
Medical Leave of Absence		
1. Cafeteria Worker I		
Amirkhan, Sarineh	Roosevelt	04/01/19 through 04/30/19
2. Senior Administrative Secretary		
Galban, Leslie	Glendale	02/27/19 through 11/03/19
Change of Medical Leave of Absence		
1. Maintenance Worker II		
Carter, Gregory	FASO	11/28/18 through 04/07/19
Extension of Medical Leave of Absence		
1. Behavior Intervention Assistant		
Sagolili, Dannah	Special Education	11/26/18 through 04/30/19

	Location	Effective Dates, Months/Hours, and Salary Rating
Family & Medical Leave of Absence		
1. Senior Administrative Secretary Galban, Leslie	Glendale	02/27/19 through 05/21/19
Maternity Leave of Absence		
1. Behavior Intervention Assistant Garay, Jennifer	Special Education	04/25/19 through 07/10/19
Extension of Maternity Leave of Absence		
1. Behavior Intervention Assistant Borjas, Madeleine	Special Education	01/31/19 through 04/16/19
Parental Leave of Absence		
1. Occupational Therapist Lopez, Stacey	College View	04/04/19 through 06/27/19
Election from Eligibility List		
1. Accounting Technician Khachikian, Adrineh	Financial Services	04/15/19; 12/8; M28-3 01.0 00000.0 00000 72007 2310 0000669
Suspension Without Pay 2019-cl-80887		04/24/19
Termination - Probationary 2019-cl-82202		04/05/19

	Location	Effective Dates, Months/Hours, and Salary Rating

Additional Assignment Temporary - At Established Rate of Pay

1. Administrative Secretary

Griffith, Allyson	Columbus	03/18/19 through 06/021/19 Not to exceed 40 hours General Fund 01.0 00000.0 00000 27004 2430 2300000
Avakyan, Marine	Jefferson	06/20/19 through 06/28/19 Not to exceed $1,232.00, total Supplemental Program 01.0 01000.0 00000 27000 2430 3000000

2. Account Clerk III

Seyfi, Armineh	Crescenta Valley	07/01/19 through 08/21/19 Not to exceed $900.00 total 01.0 00000.0 15002 42000 2430 0100000

3. Library Assistant

Sibulo, Maribel	Valley View	06/01/19 through 06/27/19 Not to exceed $341.00, total Supplemental 01.0 01000.0 11100 10000 2930 4100000
Vanda, Kari	R.D. White	06/13/19 through 06/20/19 Not to exceed $400.00, total Not to exceed 5 days, total Supplemental 01.0 01000.0 11100 10000 2930 4300000

4. Health Assistant LVN/RN

Diaz, Vanessa	Valley View	06/13/19 through 06/27/19 Not to exceed $550.00 total Supplemental 01.0 01000.0 00000 27000 2430 4100000

	Location	Effective Dates, Months/Hours, and Salary Rating

Additional Assignment Temporary - At Established Rate of Pay - Continued

5. Multimedia Technology Assistant

Murphy, Kevin	Valley View	06/01/19 through 06/27/19 Not to exceed $260.00, total Supplemental 01.0 01000.0 11100 10000 2930 4100000

6. Elementary Yard Duty Leader

Martinez, Jennifer	Educational Services	03/25/19 Not to exceed 3.5 hours 01.0 00000.0 19021 10000 2910 2300000
Galvan, Cheryl	Educational Services	03/25/19 Not to exceed 3.5 hours 01.0 00000.0 19021 10000 2910 4100000
Odjakhian, Helen	Educational Services	03/25/19 Not to exceed 3.5 hours 01.0 00000.0 19021 10000 2910 3700000

	Location	Effective Dates, Months/Hours, and Salary Rating

Change of Assignment

1. Provisional Assignment

a. Senior Administrative Secretary

Bashian, Karin	Glendale From Clerk II 12-9	04/02/19 through 06/10/19 8 hours a day 25-4 01.0 00000.0 11303 10000 2410 0200000

b. Cafeteria Worker II

Dennis, Laura	Cerritos From Cafeteria Worker I, 1-9	04/01/19 through 04/02/19 04/04/19 through 04/15/19 6.5 hours a day 4-9 13.0 53100.0 00000 37000 2212 030000

c. Cook/Baker

Rostamians, Armineh	Glendale From Cafeteria Worker I, 1-9	04/08/19 through 04/30/19 8 hours a day 9-6 13.0 53100.0 00000 37000 2212 0200000
Amigon, Marisela	College View From Cafeteria Worker I, 1-6	04/01/19 through 04/30/19 4.5 hours a day 9-4 13.0 53100.0 00000 37000 2212 02000000

	Location	Effective Dates, Months/Hours, and Salary Rating

Revisions to previous Board Reports

1. Revision to Personnel Report # 11, February 5, 2019

Page 3, Item 1

Additional Assignment Temporary - At Established Rate of Pay

Health Assistant LVN/RN

Nicolas, Aimee	Columbus	01/01/19 through 06/19/19 Not to exceed 80 hours total Supplemental Program 01.0 01000.0 00000 27000 2430 2300000
Change date to read:		01/01/19 through 06/21/19
Change hours to read:		Not to exceed 120 hours, total

2. Revision to Personnel Report # 10, January 15, 2019

Page 7, Item 3

Additional Assignment Temporary - At Established Rate of Pay

Education Assistant II

Caballero, Jose	Glendale	06/11/18 through 07/13/18 Not to exceed $2,016.00 total Title I 01.0 30100.0 11100 10000 2130 0200000
Change amount to read:		Not to exceed $2160.00, total

	Location	Effective Dates, Months/Hours, and Salary Rating

Revisions to previous Board Reports - Continued

3. Revision to Personnel Report #4, September 17, 2018

Page 18, Item 1

Personal Services Agreement

Cardea, Paola	Consultant, as needed to provide assistance in the classroom for the Italian Dual Language Program at Franklin Magnet School For the 2018-2019 School year	08/22/18 through 06/11/19 Not to exceed $19,120.00 total $24.00 per hour Italian Language Grant 01.0 94372.0 11100 10000 5811 0000611

Change amount to read: Not to exceed $20,880.00, total

	Location	Effective Dates, Months/Hours, and Salary Rating

Revisions to previous Board Reports - Continued

4. Revision to Personnel Report # 1, July 17, 2018

Page 35, Item 6

Personal Services Agreement

Junker, Karen	Consultant as needed, to conduct Restorative Practicers small group support team for the Glendale Unified School District for the 2018-2019 school year	07/01/18 through 06/30/19 Not to exceed $15,000.00 total 01.0 07405.0 11100 10000 5811 0000618

Change amount to read: Not to exceed $63,000.00, total

	Location	Effective Dates, Months/Hours, and Salary Rating

Election of Classified Hourly Substitutes (Cafeteria Worker I) through 06/30/19

Castaneda, Elva
Contreras, Mario
Nessim, Vivian
Novruzyan, Rima
Myers, Arlen
Santos, Arlene

04/01/19 through 06/30/19
13.0 53100.0 00000 37000 2232 0000662

Election of Classified/Non Classified Hourly Substitutes through 06/30/19

1. Babysitter

Allahverdi, Remik Valijani, Satenik	Special Education	04/08/19 through 06/30/19 $12.00 per hour Not to exceed $500.00 total Special Education-SAI-Core 01.0 65000.0 57707 11200 2130 0000600

2. Student Assistant I

Merkuri, Franko Ramirez, Jennifer Ramos, Leonel	SELPA	04/02/19 through 06/30/19 $12.00 per hour 01.0 65200.0 57700 11100 2180 0000668

	Location	Effective Dates, Months/Hours, and Salary Rating

Personal Services Agreement

1. Stefin, Khrystie S.	Consultant, as needed to lead and after school program to mentor students at Toll Middle School	04/03/19 through 06/05/19 Not to exceed $780.00 total $60.00 per hour Title I 01.0 30100.0 11100 10000 5811 0700000

Transportation Authorization 2018-19

1. It is recommended that the individuals be authorized to receive transportation expenses at the rate of 58.0¢ per mile, effective July 1, 2018, through June 30, 2019:

Attendance Worker		
Melara, Lilian	Child Welfare & Attendance	07/01/18 through 06/30/19: 58.0¢ (2019) 54.5¢ (2018) Child Welfare and Attendance 01.0 05641.0 11100 10000 5210 0000617
Psychological Services Provider		
Kerkyasharian, Salpi Ourfalian, Laura	Child Welfare & Attendance	07/01/18 through 06/30/19: 58.0¢ (2019) 54.5¢ (2018) Child Welfare and Attendance 01.0 05641.0 11100 10000 5210 0000617
Typist Clerk II		
Haghverdian, Vartoush Patatian, Boghos	Child Welfare & Attendance	07/01/18 through 06/30/19: 58.0¢ (2019) 54.5¢ (2018) Child Welfare and Attendance 01.0 05641.0 11100 10000 5210 0000617

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 4

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Stephen Dickinson, Chief Business and Financial Officer
PREPARED BY:	Karineh Savarani, Director, Financial Services
SUBJECT:	**Warrants – District Funds**

The Interim Superintendent recommends that "A" Form (Payroll Warrants) issued April 1, 2019 – April 10, 2019 as shown below totaling $9,244,161.72, and "B" Form (Other than Payroll Warrants) issued March 1 – 31, 2019, totaling $11,754,105.73 be approved. Funding for Form "A" Warrants is accounted for in the following funds: 01.0 General Fund, 12.0 Child Development Fund, 13.0 Cafeteria Fund, 21.1 Measure S Projects Fund, and 25.0 Capital Facilities Fund.

This agenda item is in support of Board Priority No. 4 – Maintain District Solvency & Financial Responsibility.

REGISTERED NUMBER	WARRANT NUMBER			DESCRIPTION		AMOUNT
C1I-C	6121290	-	6121345	Certificated	$	7,041,289.17
087-N	6122351	-	6122352	Classified		5,081.24
C5I-C	6125874	-	6125953	Certificated		472,368.44
C5I-N	6125954	-	6125958	Classified		9,808.99
093-C	6128233	-	6128240	Certificated		1,207.90
093-N	6128241	-	6128241	Classified		2,789.69
094-C	6128333	-	6128335	Certificated		1,497.29
E4R-N	6129410	-	6129511	Classified		1,362,019.91
095-N	6136560	-	6136563	Classified		1,313.98
C3I-N	6140401	-	6140581	Classified		346,785.11
					$	**9,244,161.72**

GLENDALE UNIFIED SCHOOL DISTRICT
CONSENT CALENDAR NO. 4

SUMMARY OF COMMERCIAL WARRANTS ISSUED FROM
MARCH 1 THRU MARCH 31, 2019

OBJECT CODE	DESCRIPTION	NUMBER OF ENTRIES	AMOUNT
	1.0 GENERAL FUND		
3932	OTHER DISTRICT PAID BENEFITS	2	$ 3,646.98
4110	TEXTBOOKS	12	6,999.64
4210	BOOKS & OTHER REFERENCE MATERIAL	19	1,667.21
4220	LIBRARY BOOKS	2	1,481.78
4310	INST. MATERIALS & SUPPLIES	561	83,309.87
4312	INST. PERIODICALS & MAGAZINES	3	137.75
4317	COMMENCEMENT	2	253.48
4350	OFFICE & OTHER SUPPLIES	165	26,074.61
4351	PRINTING & REPRODUCTION	29	13,081.44
4353	EDIBLE SUPPLIES	160	28,610.50
4360	TIRES, FUEL AND OIL	3	8,978.18
4370	CUSTODIAL/OPERATION SUPPLIES	72	15,870.79
4372	POOL SUPPLIES	4	1,691.89
4380	MAINTENANCE SUPPLIES	29	7,333.76
4381	REPAIR SUPPLY & MATERIALS	116	76,624.26
4420	NON-CAP EQUIP -UNTAGGED	99	73,402.71
4430	NON-CAP EQUIP - TAGGED	33	85,339.87
5100	SUBAGREEMENT FOR SERVICES	4	12,913.82
5210	MILEAGE & CAR ALLOWANCES	65	7,194.82
5220	TRAVEL AND CONFERENCES	98	30,185.75
5510	NATURAL GAS SERVICES	11	75,616.13
5520	ELECTRICITY SERVICES	62	249,100.57
5530	WATER	62	44,250.15
5561	TRASH DISPOSAL	4	11,039.34
5562	SEWER CHARGES	66	22,448.46
5610	RENTALS, LEASES AND REPAIRS	46	24,461.28
5630	REPAIRS	87	84,372.45
5804	NON-PUBLIC SCHOOL	67	478,177.33
5811	PERSONAL SERVICES	75	139,789.94
5812	NON-PSA SERVICE AGREEMENT	167	489,300.42
5813	UNIFORM SERVICES	2	4,716.56
5814	TRANSPORTATION	23	11,634.61
5815	OPERATING SERVICES	184	950,561.68
5816	NON-PUBLIC SCHOOL SERVICES	150	636,260.56
5821	LEGAL FEES	15	78,657.00
5823	SPEC ED LEGAL SETTLEMENTS	3	15,996.58
5825	AUDIT FEES	4	38,125.00
5828	SPED PARENT ATTORNEY FEES	2	34,750.00
5852	NON-INSTRUCTIONAL, CONSULTANTS	6	30,161.58
5853	CONTRACTUAL SERVICES	1	2,089.00
5862	PHYSICALS FOR EMPLOYEES	6	1,011.88
5911	POSTAGE/UPS/FEDEX	5	584.78

GLENDALE UNIFIED SCHOOL DISTRICT
CONSENT CALENDAR NO. 4

SUMMARY OF COMMERCIAL WARRANTS ISSUED FROM
MARCH 1 THRU MARCH 31, 2019

OBJECT CODE	DESCRIPTION	NUMBER OF ENTRIES	AMOUNT
5912	TELEPHONE	15	14,727.01
5914	DATA LINE	1	48.52
5916	OTHER PHONES	4	7,232.65
6170	LAND-IMPROVEMENTS	1	14,750.00
6210	ARCHITECT FEES ON BUILDINGS	1	10,950.00
6250	BUILDING CONSTRUCTION/IMPROV	2	19,912.00
6293	PRINTING & DISTRIBUTION	1	351.29
6490	CAPITALIZED EQUIPMENT	9	110,408.53
8689	ALL OTHER FEES AND CONTRACTS	1	50.00
8699	ALL OTHER LOCAL REVENUES	2	13,199.41
9320	STORES	1	1,861.50
9530	FRINGE BENEFITS SUBS - H&W	4	2,880,688.07
9551	SALES TAX PAYABLE	1	72.98
9552	USE TAX PAYABLE	50	6,486.34
9601	EMPLOYEE FINAL PAY LIABILITY	1	175.96
		2,620	6,988,818.67
	12.0 CHILD DEVELOPMENT FUND		
4310	INST. MATERIALS & SUPPLIES	8	541.70
4350	OFFICE & OTHER SUPPLIES	11	534.05
4353	EDIBLE SUPPLIES	9	2,235.79
4370	CUSTODIAL/OPERATION SUPPLIES	7	859.23
5210	MILEAGE & CAR ALLOWANCES	2	132.50
5220	TRAVEL AND CONFERENCES	1	129.00
5812	NON-PSA SERVICE AGREEMENT	35	12,298.03
5815	OPERATING SERVICES	4	3,235.51
5916	OTHER PHONES	1	23.87
8673	BUILDING CONSTRUCTION/IMPROV	2	84.00
9552	USE TAX PAYABLE	1	3.42
		81	20,077.10
	13.0 CAFETERIA FUND		
4350	OFFICE & OTHER SUPPLIES	10	623.85
4351	PRINTING & REPRODUCTION	1	439.11
4360	TIRES, FUEL AND OIL	9	1,093.36
4380	MAINTENANCE SUPPLIES	5	273.61
4381	REPAIR SUPPLY & MATERIALS	3	452.00
4395	NON-FOOD SUPPLIES	3	29,419.45
4420	NON-CAP EQUIP -UNTAGGED	1	303.24

GLENDALE UNIFIED SCHOOL DISTRICT
CONSENT CALENDAR NO. 4

SUMMARY OF COMMERCIAL WARRANTS ISSUED FROM
MARCH 1 THRU MARCH 31, 2019

OBJECT CODE	DESCRIPTION	NUMBER OF ENTRIES	AMOUNT
4430	NON-CAP EQUIP - TAGGED	3	3,343.56
4710	FOOD	68	276,928.42
5220	TRAVEL AND CONFERENCES	1	153.96
5563	PEST CONTROL	2	1,088.88
5610	RENTALS, LEASES AND REPAIRS	4	7,949.24
5815	OPERATING SERVICES	14	9,914.02
5817	MONEY PICK-UPS	1	3,170.34
5916	OTHER PHONES	1	109.54
6490	CAPITALIZED EQUIPMENT	2	29,030.98
8290	ALL OTHER FEDERAL REVENUES	1	5,885.09
8634	FOOD SERVICE SALES	5	634.05
9551	SALES TAX PAYABLE	1	276.53
9552	USE TAX PAYABLE	1	4.28
		136	371,093.51
	21.1 MEASURE S PROJECTS FUND		
4350	OFFICE & OTHER SUPPLIES	3	239.34
4351	PRINTING & REPRODUCTION	1	1,114.73
4420	NON-CAP EQUIP -UNTAGGED	3	733.41
4430	NON-CAP EQUIP - TAGGED	5	9,700.14
5210	MILEAGE & CAR ALLOWANCES	1	131.92
5610	RENTALS, LEASES AND REPAIRS	2	414.32
5821	LEGAL FEES	1	4,172.00
5852	NON-INSTRUCTIONAL, CONSULTANTS	1	1,532.50
5911	POSTAGE/UPS/FEDEX	1	205.14
6150	SURVEYS FOR SITE PURCHASES	1	11,500.00
6210	ARCHITECT FEES ON BUILDINGS	13	49,279.23
6231	DSA PLAN CHECK FEES	1	28,374.01
6250	BUILDING CONSTRUCTION/IMPROV	8	525,024.88
6252	OTHER CONSTRUCTION	5	5,684.86
6275	CONST TSTNG ON BLDNGS & IMPROV	8	28,725.45
6282	MOVING-STORAGE	2	1,724.00
6294	ADVERTISEMENTS & NOTICES	1	730.08
9552	USE TAX PAYABLE	1	1.42
		58	669,287.43
	21.2 CLEAN RENEWABLE ENERGY BONDS		
6280	BUILDING INSPECTIONS	1	3,105.00
		1	3,105.00

GLENDALE UNIFIED SCHOOL DISTRICT
CONSENT CALENDAR NO. 4

SUMMARY OF COMMERCIAL WARRANTS ISSUED FROM
MARCH 1 THRU MARCH 31, 2019

OBJECT CODE	DESCRIPTION	NUMBER OF ENTRIES	AMOUNT
	25.0 CAPITAL FACILITIES FUND		
8681	MITIGATION/DEVELOPERS FEES	1	8,633.38
		1	8,633.38
	40.1 SPEC RESERVE - CAPITAL PROJECTS		
5520	ELECTRICITY SERVICES	2	494.41
5530	WATER	1	316.22
5562	SEWER CHARGES	2	198.49
5563	PEST CONTROL	0	0.00
5610	RENTALS, LEASES AND REPAIRS	2	5,462.00
5630	REPAIRS	15	5,697.17
5815	OPERATING SERVICES	6	3,957.52
6210	ARCHITECT FEES ON BUILDINGS	3	7,639.26
6294	ADVERTISEMENTS & NOTICES	1	679.76
7438	DEBT SERVICE - INTEREST	2	257,878.71
7439	OTHER DEBT SERVICE PAYMENTS	2	403,919.97
		36	686,243.51
	67.0 SELF-INSURANCE FUND		
5872	DELTA ADMINISTRATIVE FEES	2	14,853.56
5873	VSP CLAIMS	13	45,990.71
5874	VSP ADMINISTRATIVE FEES	1	4,120.13
5875	DELTA PAYMENTS	1	229,537.71
5877	MEDIMPACT CLAIMS	1	7,925.15
5878	MEDIMPACT PAYMENTS	2	559,501.71
		20	861,928.97
	67.1 WORKERS' COMPENSATION FUND		
5815	OPERATING SERVICES	1	996,380.00
5852	NON-INSTRUCTIONAL, CONSULTANTS	1	11,814.92
		2	1,008,194.92
	67.2 EARLY RETIREMENT BENEFITS FUND		
5815	OPERATING SERVICES	1	156,169.15
		1	156,169.15

GLENDALE UNIFIED SCHOOL DISTRICT
CONSENT CALENDAR NO. 4

SUMMARY OF COMMERCIAL WARRANTS ISSUED FROM
MARCH 1 THRU MARCH 31, 2019

OBJECT CODE	DESCRIPTION	NUMBER OF ENTRIES	AMOUNT
	73.0 FOUNDATION TRUST FUND		
7699	ALL OTHER FINANCING USES	1	1,197.73
		1	1,197.73
	76.0 WARRANT PASS-THROUGH FUND		
9517	VOLUNTARY DEDUCTIONS	17	612,999.36
9518	TAX SHELTER ANNUITY	1	357,887.00
9588	ROTH IRA-LACOE USED ONLY	1	8,470.00
		19	979,356.36
	TOTALS	**2,976**	**$ 11,754,105.73**

#

#

#

#

#

#

#

#

#

#

#

#

#

#

#

#

#

#

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 5

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Stephen Dickinson, Chief Business and Financial Officer
PREPARED BY:	Craig Larimer, Financial Analyst
SUBJECT:	**Appropriation Transfer and Budget Revision Report**

The Interim Superintendent recommends that the Board of Education approve Appropriation Transfers and Budget Revisions for Fund 01.0 Unrestricted, Restricted and Fund 40.1.

This agenda item is in support of Board Priority No. 4 – Maintain District Solvency & Financial Responsibility.

GLENDALE UNIFIED SCHOOL DISTRICT
April 16, 2019
CONSENT CALENDAR NO. 5
BUDGET TRANSFER AND ADJUSTMENT REPORT

GENERAL FUND UNRESTRICTED (01.0) Resource Codes 00000.0 thru 19999.0

REVENUES		BUDGET TRANSFERS	BUDGET ADJUSTMENTS
8010-8099	Local Control Funding Formula	$0	$0
8100-8299	Federal	$0	$0
8300-8599	Other State	$0	$0
8600-8799	Local	$0	($1,014,781)
8910-8999	Transfers In/Contributions	$0	$0
TOTAL REVENUES		$0	($1,014,781)

APPROPRIATION OBJECT		BUDGET TRANSFERS	BUDGET ADJUSTMENTS
1000	Certificated Salaries	$0	$0
2000	Classified Salaries	$773	$0
3000	Employee Benefits	$227	$0
4000	Instructional Supplies	$5,596	$26,369
5000	Contract Services	($5,596)	($26,150)
6000	Capital Outlay	($1,000)	$0
7000	Other Outgo/Indirect/Transfers Out	$0	($1,231,000)
TOTAL BUDGETED APPROPRIATIONS		$0	($1,230,781)

NET INCREASE/DECREASE IN FUND BALANCE	$0	$216,000

April 16, 2019
BUDGET TRANSFER AND ADJUSTMENT REPORT
CONSENT CALENDAR NO. 5
BUDGET TRANSFER AND ADJUSTMENT DETAIL REPORT
GENERAL FUND, UNRESTRICTED (01.0) Resource Codes 00000.0 thru 19999.0

BUDGET TRANSFERS

Dept./School	Program Description	1,000	2,000	3,000	4,000	5,000	6,000	7,000	9,000	Total	Transfer provides funds for:
Columbus	General Fund	0	773	227	(1,000)	0	0	0	0	$0	Classified Salaries & Benefits
Columbus	General Fund	0	0	0	0	0	0	0	0	$0	Supplies
Mann	General Fund	0	0	0	3,048	(3,048)	0	0	0	$0	Supplies
Rooselvet	General Fund	0	0	0	0	0	0	0	0	$0	Supplies
Mann	General Fund	0	0	0	3,048	(3,048)	0	0	0	$0	Supplies
Fremont	General Fund	0	0	0	0	0	0	0	0	$0	Supplies
Various	Supplemental Program	0	0	0	500	500	(1,000)	0	0	$0	Supplies & Services
		$0	**$773**	**$227**	**$5,596**	**($5,596)**	**($1,000)**	**$0**	**$0**	**$0**	

Dept./School	Program Description	1,000	2,000	3,000	4,000	5,000	6,000	7,000	9,000	Total	Adjustment appropriates funds for:
FASO	Civic Center	0	0	0	0	219	0	0	0	$219	Insurance Fees
CVHS	General Fund	0	0	0	26,369	(26,369)	0	0	0	$0	Supplies
District	District	0	0	0	0	0	0	(1,231,000)	216,000	($1,015,000)	Unrestricted General Fund RDA Adjustment
District Misc. Income	General Fund	0	0	0	0	0	0	0	0	$0	Adjustment
		0	0	0	0	0	0	0	0	$0	
		$0	**$0**	**$0**	**$26,369**	**($26,150)**	**$0**	**($1,231,000)**	**$216,000**	**($1,014,781)**	

Object Codes

1000 Certificated Salaries
2000 Classified Salaries
3000 Employee Benefits
4000 Books & Supplies
5000 Services & Other Operating Supplies
6000 Capital Outlay
7000 Other Outgo
9000 Reserves

GLENDALE UNIFIED SCHOOL DISTRICT
April 16, 2019
CONSENT CALENDAR NO. 5
BUDGET TRANSFER AND ADJUSTMENT REPORT

GENERAL FUND RESTRICTED (01.0) Resource Codes 20000.0 thru 99999.0

REVENUES		BUDGET TRANSFERS	BUDGET ADJUSTMENTS
8010-8099	Local Control Funding Formula	$0	$0
8100-8299	Federal	$0	$0
8300-8599	Other State	$0	$0
8600-8799	Local	$0	$3,280,258
8910-8999	Transfers In/Contributions	$0	$0
TOTAL REVENUES		$0	$3,280,258

APPROPRIATION OBJECT		BUDGET TRANSFERS	BUDGET ADJUSTMENTS
1000	Certificated Salaries	$0	$1,815
2000	Classified Salaries	$0	$0
3000	Employee Benefits	$0	$361
4000	Instructional Supplies	$5,200	$71,111
5000	Contract Services	$0	$8,602
6000	Capital Outlay	($5,200)	$0
7000	Other Outgo/Indirect/Transfers Out	$0	$3,200,000
TOTAL BUDGETED APPROPRIATIONS		$0	$3,281,889

NET INCREASE/DECREASE IN FUND BALANCE	$0	($1,631)

GLENDALE UNIFIED SCHOOL DISTRICT
April 16, 2019
CONSENT CALENDAR NO. 5
BUDGET TRANSFER AND ADJUSTMENT REPORT
GENERAL FUND, RESTRICTED (01.0) Resource Codes 20000.0 thru 99999.0

BUDGET TRANSFERS	Program Description	Resource									
Total Budget Trsfrs	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx		1000	2000	3000	4000	5000	6000	7000	9000	Total	Transfer provides funds for:
Fremont	Donations	30100.0	0	0	0	0	0	0	0	0	$0	Services
Various	Title I	30100.0	0	0	0	5,200	0	(5,200)	0	0	$0	Supplies
			0	0	0	0	0	0	0	0	$0	
			$0	**$0**	**$0**	**$5,200**	**$0**	**($5,200)**	**$0**	**$0**	**$0**	

BUDGET ADJUSTMENTS												
Dept/Site	**Program Description**	**Resource Code**	**1000**	**2000**	**3000**	**4000**	**5000**	**6000**	**7000**	**9000**	**Total**	**Adjustment appropriates funds for:**
Special Education	Special Olympics program	30100.0	0	0	0	89	3,191	0	0	(3,280)	$0	To appropriate 17/18 carryover
Lincoln	School Site Donations	30100.0	0	0	0	6,600	0	0	0	0	$6,600	To allocate income (Chromebooks)
Toll	Donation from Special Olympics Southern California	30100.0	0	0	0	558	350	0	0	0	$908	To allocate income
Lincoln	Donation from Korean Parent Club	30100.0	0	0	0	650	0	0	0	0	$650	To allocate income
Public Information	PEGS fees	30100.0	0	0	0	31,746	0	0	0	0	$31,746	To allocate income
Facts Program	School Site Donations	30100.0	0	0	0	4	0	0	0	0	$4	To allocate income
EEELP	School Site Donations	30100.0	0	0	0	0	527	0	0	0	$527	To allocate income
EEELP	School Site Donations	30100.0	0	0	0	0	178	0	0	0	$178	To allocate income
Rosemont	School Site Donations	30100.0	1,320	0	256	0	0	0	0	0	$1,576	To allocate income (Substitute salary)
Glenoaks	School Site Donations	30100.0	0	0	0	(974)	0	0	0	1,649	$675	To allocate income
Toll	School Site Donations	30100.0	495	0	105	0	0	0	0	0	$600	To allocate income
Monte Vista	School Site Donations	30100.0	0	0	0	290	0	0	0	0	$290	To allocate income
Child Welfare Attendanc	Donation from Glendale Council PTA	30100.0	0	0	0	0	300	0	0	0	$300	To allocate income
Categorical Program	Adelante Latinos	30100.0	0	0	0	0	100	0	0	0	$100	To allocate income
Facts Program	School Site Donations	30100.0	0	0	0	16	0	0	0	0	$16	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	0	750	0	0	0	$750	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	0	321	0	0	0	$321	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	0	263	0	0	0	$263	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	267	0	0	0	0	$267	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	2,975	0	0	0	0	$2,975	To allocate income (6th gr Camp porgram)
Franklin	School Site Donations	30100.0	0	0	0	140	0	0	0	0	$140	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	15,408	0	0	0	0	$15,408	To allocate income (6th gr recycling)
Franklin	School Site Donations	30100.0	0	0	0	1,185	0	0	0	0	$1,185	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	0	686	0	0	0	$686	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	225	0	0	0	0	$225	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	2,625	0	0	0	0	$2,625	To allocate income (6th gr Camp porgram)
Franklin	School Site Donations	30100.0	0	0	0	4,900	0	0	0	0	$4,900	To allocate income (6th gr Camp porgram)
Franklin	School Site Donations	30100.0	0	0	0	0	502	0	0	0	$502	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	0	761	0	0	0	$761	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	0	330	0	0	0	$330	To allocate income
Franklin	School Site Donations	30100.0	0	0	0	2,276	0	0	0	0	$2,276	To allocate income (6th gr Camp porgram)
Franklin	School Site Donations	30100.0	0	0	0	0	343	0	0	0	$343	To allocate income
Rosemont	School Site Donations	30100.0	0	0	0	1,008	0	0	0	0	$1,008	To allocate income
Rosemont	School Site Donations	30100.0	0	0	0	1,000	0	0	0	0	$1,000	To allocate income (Chromebooks)
District	District	30100.0	0	0	0	123	0	0	0	0	$123	To allocate income
			0	0	0	0	0	0	3,200,000	0	$3,200,000	Restricted General Fund RDA Adjustment
			0	0	0	0	0	0	0	0	$0	
Total Budget Adjustments			**$1,815**	**$0**	**$361**	**$71,111**	**$8,602**	**$0**	**$3,200,000**	**($1,631)**	**$3,280,258**	

Object Codes
1000 Certificated Salaries
2000 Classified Salaries
3000 Employee Benefits
4000 Books & Supplies
5000 Services & Other Operating Expenses
6000 Capital Outlay
7000 Other Outgo
8000 Income
9000 Designated Reserves

GLENDALE UNIFIED SCHOOL DISTRICT
April 16, 2019
CONSENT CALENDAR NO. 5
BUDGET TRANSFER AND ADJUSTMENT REPORT

Capital Projects Fund (40.1)

REVENUES		BUDGET TRANSFERS	BUDGET ADJUSTMENTS
8010-8099	Revenue Limit	$0	$0
8100-8299	Federal	$0	$0
8300-8599	Other State	$0	$0
8600-8799	Local	$0	$0
8910-8999	Transfers In/Contributions	$0	$1,969,000
TOTAL REVENUES		$0	$1,969,000

APPROPRIATION OBJECT		BUDGET TRANSFERS	BUDGET ADJUSTMENTS
1000	Certificated Salaries	$0	$0
2000	Classified Salaries	$0	$0
3000	Employee Benefits	$0	$0
4000	Instructional Supplies	$0	$0
5000	Contract Services	$0	$0
6000	Capital Outlay	$0	$1,969,000
7000	Other Outgo/Indirect/Transfers Out	$0	$0
TOTAL BUDGETED APPROPRIATIONS		$0	$1,969,000

NET INCREASE/DECREASE IN FUND BALANCE	$0	$0

GLENDALE UNIFIED SCHOOL DISTRICT
April 16, 2019
CONSENT CALENDAR NO. 5
Capital Projects Fund (40.1) Unrestricted

BUDGET TRANSFERS

Dept.	Program Description	1000	2000	3000	4000	5000	6000	7000	9000	Total	Transfer provides funds for:
		0	0	0	0	0	0	0	0	0	
Total Budget Transfers		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	

BUDGET ADJUSTMENTS

Dept/Site	Program Description	1000	2000	3000	4000	5000	6000	7000	9000	Total	Revision appropriates funds for:
District	RDA Adjustment	0	0	0	0	0	1,969,000	0	0	1,969,000	Capital outlay Fund RDA Adjustment
		0	0	0	0	0	0	0	0	0	
Total Budget Adjustments		**$0**	**$0**	**$0**	**$0**	**$0**	**$1,969,000**	**$0**	**$0**	**$1,969,000**	

Object Codes

1000 Certificated Salaries
2000 Classified Salaries
3000 Employee Benefits
4000 Books & Supplies
5000 Services & Other Operating Supplies
6000 Capital Outlay
7000 Other Outgo
9000 Reserves

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 6

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

SUBMITTED BY: Stephen Dickinson, Chief Business and Financial Officer

PREPARED BY: Karineh Savarani, Director, Financial Services

SUBJECT: **Lease Agreement with GEF Summer School, Inc. (GEFSS)**

The Interim Superintendent recommends that the Board of Education approve the lease agreement with GEF Summer School, Inc. (GEFSS).

This agenda item is in support of Board Priority No. 4 – Maintain District Solvency & Financial Responsibility.

The GEF Summer School, Inc. (GEFSS) program will be using the Glendale Unified School District facilities to hold summer school enrichment classes. The attached agreement between the District and GEFSS governing the operation of summer school educational programs and the rental and use of Glendale Unified School District facilities is a renewal of our previous lease agreement. The GEFSS Board approved this agreement on March 26, 2019.

Staff is recommending that the Board of Education approve the lease agreement with GEFSS.

#

#

LEASE AGREEMENT FOR USE OF SCHOOL PROPERTY

BETWEEN THE

GLENDALE UNIFIED SCHOOL DISTRICT

AND GEF SUMMER SCHOOL, INC.#

GOVERNING THE OPERATION OF SUMMER SCHOOL EDUCATIONAL PROGRAMS

AND THE RENTAL AND USE OF GLENDALE UNIFIED SCHOOL DISTRICT FACILITIES

THIS AGREEMENT made and entered into on the 16th day of April 2019, by and between the GLENDALE UNIFIED SCHOOL DISTRICT, hereinafter referred to as "District", and GEF SUMMER SCHOOL, INC., a California nonprofit corporation, hereinafter referred to as "GEFSS".

WITNESSETH

WHEREAS, District is the owner of certain properties consisting of real property and school facilities located in Glendale, California ("Facilities") for the term set forth in Section 8 below;

WHEREAS, pursuant to sections 38130, et seq. of the California Education Code and Board policy of the District, provisions are made for use of buildings and grounds of public school districts for educational purposes in the public interest;

WHEREAS, GEFSS desires to conduct such educational programs in the public interest on a non-profit basis;

WHEREAS, the District has determined that such programs will not result in additional costs to the District; and

WHEREAS, District and GEFSS desire to enter into a mutually beneficial arrangement for GEFSS's use of the District facilities at the School Site to operate GEFSS's educational program.

NOW, THEREFORE, the District and Foundation agree as follows;

1. GRANT OF USE OF DISTRICT FACILITIES

1.1 The District does hereby agree to allow GEFSS the use of certain buildings, parking, restrooms, offices and grounds of the District, more particularly described in Schedule A attached hereto (the "Facilities") .

1.2 Such Facilities are to be used by GEFSS for the purpose of conducting high school and middle school summer educational classes and other related uses ("Program"). All uses of the Facilities by GEFSS shall be consistent with the use of the Facilities by the District for school purposes and comply with all federal, state, and local regulations.

1.3 Understood in the above is that the District itself may conduct state-reimbursed programs on the Facilities. The District reserves the right to use said Facilities, or to allow the Facilities to be used by others at all times so long as such use by the District or others does not interfere with the use of the facilities by the GEFSS for the program. District may permit another person or entity to use the Facilities pursuant to the "Civic Center Act" (Education Code section 38130 et seq.) Access under the Civic Center Act will be coordinated with the GEFSS's use of the Facilities.

1.4 GEFSS recognizes that all or a portion of the Facilities may need to be closed from time to time in the interest of public safety, construction, or for repairs or routine maintenance. District shall give GEFSS at least seven days prior written notice of the need to close Facilities as far in advance as possible, in the event of any closure except in cases of emergency. GEFSS shall immediately notify District of any conditions necessitating a closure of the Facilities or any portion thereof. The District shall use its best efforts to coordinate the closing of the Facilities with GEFSS's use thereof.

1.5 GEFSS will have access to the Facilities Monday through Friday from 7:00 a.m. to 4:00 p.m. Modifications to this schedule of use may only be made with the prior written consent of the District.

2. TUITION AND FEES

GEFSS may collect tuition and other fees from all students who enroll in the Program offered by GEFSS, and the determination of such fees shall be in the sole discretion of GEFSS, to the end that such charges will be sufficient to cover all expenditures made by GEFSS in conducting the Program.

3. SCHEDULE OF CHARGES AND BILLING PROCEDURES

3.1 For and in consideration of the use of the Facilities, GEFSS agrees to pay the District fees in accordance with the schedule of charges attached hereto as Schedule B and hereby made a part of this Agreement ("Facility Fees").

3.2 The Facility Fees set forth in Schedule B represent sufficient fees to cover the costs to the District resulting from the use of the Facilities by GEFSS, including the use and maintenance of restrooms, utilities, textbooks, library facilities and support, technology support, and normal custodial/maintenance services and supplies. All custodians or maintenance employees, use of textbooks, technology support services, and library support services shall be provided to GEFSS by the District in exchange for the applicable Facility Fee indicated on Schedule B, if any. Any employees required for such District provided services shall be employed and supervised by the District.

As for security, if GEFSS classes are held on school site where existing security is being provided for remedial summer classes by the District, no fees will be charged for security coverage. Otherwise, GEFSS will be responsible for security coverage.

3.3 GEFSS agrees to reimburse the District for any damage to or theft of any equipment or other personal property that occurs as a direct result of the use of the Facilities by GEFSS pursuant to this Agreement.

3.4 At the end of the Term (as defined below) or upon earlier termination of this Agreement by either party, the District shall send GEFSS an invoice, itemizing the total charges for the use of the Facilities calculated according to the schedule of Facilities Fees set forth in Schedule B. GEFSS shall pay the invoice to the District within thirty (30) days of receipt.

4. RESPONSIBILITIES

4.1 GEFSS will be solely responsible for determining and administering the Program offered by it pursuant to this Agreement. GEFSS shall be responsible for the collection of all tuition, fees, and other costs. Additionally, all academic, administrative, and secretarial personnel shall be selected and employed by GEFSS and such employees will be subject to GEFSS's sole direction and control. When appropriate, and to the extent feasible, GEFSS, in hiring employees for its Program, will give preference to qualified administrators, teachers, and security personnel currently employed by the District. GEFSS shall be responsible for all costs of such personnel imposed by law and/or contract.

4.2 GEFSS appoints Susan Hunt as the Program Coordinator and further agree that the Program Coordinator will meet with the District to collaborate on the use of the Facilities and to work out a systematic and effective record-keeping system for the distribution of textbooks to students attending GEFSS summer classes. All such distributions must be approved in writing by the site principal.

4.3 During the Term of this Agreement, GEFSS shall maintain the Facilities in a good condition consistent with the condition existing at the time of delivery. GEFSS acknowledges and accepts the Facilities in an "AS IS" condition. GEFSS shall not be required to reimburse District for the cost of repairs to the Facilities unless such repair is required because of the negligence or willful misconduct of GEFSS or its employees, agents, or invitees in which event necessary repairs or replacements shall be charged to GEFSS.

4.4 GEFSS shall be responsible for ensuring compliance with all applicable fingerprinting and criminal background investigation requirements for its employees, contractors and consultants described in Education Code section 45125.1, which may be met under the fingerprinting provisions of Title 22 of the California Code of Regulations and applicable provisions of the California Health and Safety Code relevant to community care facility licensing (Health & Safety Code § 1500 et seq.). Upon District's request, GEFSS shall provide written verification of compliance with the aforementioned fingerprinting and criminal background investigation requirements to District prior to each individual's commencement of employment or participation in the Program and prior to permitting contact with any pupils.

4.5 GEFSS shall be responsible for supervision and control of the students enrolled in the Program and Facilities at all times when the Facilities are used by GEFSS.

4.5.1 GEFSS shall have a full-time employee whose responsibilities shall include management of GEFSS's use, supervision responsibilities at the Facilities, and maintenance to the extent necessary, which person shall be deemed to be solely a GEFSS employee at all times and whose salary and other expenses shall be borne by GEFSS.

4.5.2 GEFSS shall provide additional qualified supervisors, attendants and/or other necessary personnel as needed during GEFSS's use of the Facilities. The salaries and other expenses of such personnel shall be borne by Foundation.

4.5.3 GEFSS shall not install equipment on the Facilities without the prior written consent of District.

4.6 Prior to permitting any employee, consultant or contractor to have access to any District student under the terms of this Agreement, GEFSS shall require each such party to submit evidence of an examination within the past sixty (60) days to determine that he or she is free of active tuberculosis. Foundation agrees to adhere to the tuberculosis test requirements of Education Code Section 49406 for each such party.

4.7 GEFSS shall, at GEFSS's expense, comply with all requirements of all governmental authorities, in force either now or in the future, affecting the Facilities and the Program, and shall faithfully observe in GEFSS's use of the Facilities and operation of the Program all laws, regulations and ordinances of these authorities, in force either now or in the future including, without limitation, all applicable federal, state and local laws, regulations, and ordinances pertaining to air and water quality, hazardous material, waste disposal, air emission and other environmental matters (including the California Environmental Quality Act ("CEQA") and its implementing regulations in its use of the Facilities), all District policies, rules and regulations and all credentialing requirements for administrators and teachers.

5. CLASSES

5.1 GEFSS will conduct the summer school portion of its Program beginning June 17, 2019, and ending July 19, 2019. GEFSS will conduct the Program using the Facilities on the School Site.

5.2 If, when Program enrollment closes, the average number of students enrolled in all classes is fewer than twenty-five (25) students per class, GEFSS reserves the right to cancel classes with fewer than twenty-five (25) students until the average enrollment for all classes is at least twenty-five (25) students. Such determination is at the sole discretion of GEFSS.

5.3 All Program curriculum offered for public school credit during the Term of this Agreement must meet the approval of the District in order to allow for District recognition of credits earned by District students.

6. INSURANCE AND INDEMNIFICATION

6.1 GEFSS shall, at its expense, obtain and keep in force during the Term of this Agreement coverage for its employees, consultants, contractors and authorized agents for activities conducted in connection with this Agreement by maintaining in full force and effect insurance and/or self-insurance as follows:

6.1.1 General Liability coverage with a limit of One Million Dollars ($1,000,000) per occurrence and an aggregate of Three Million Dollars ($3,000,000).

6.l.2 Workers' Compensation coverage covering GEFSS full liability as required under State law.

6.1.3 Such other insurance in such amounts which from time to time may be reasonably required by the mutual consent of the parties, against other insurable risks relating to this Agreement. It should be expressly understood, however, that the coverage required under this Section shall not in any way limit the liability of GEFSS.

6.l.4 GEFSS, upon the execution of this Agreement, shall furnish District with certificates evidencing compliance with these insurance requirements. Certificates shall further provide for thirty (30) days advance written notice to District of any cancellation of the above coverage.

6.2 GEFSS agrees to indemnify, defend, save, and hold harmless the District, its officers, employees, agents, and independent contractors from and against all manner of claim, demand, debt, lien, loss, damage or liability, cost or expense (including, but not be way of limitation, attorney fees and costs actually incurred whether or not litigation has commenced), judgments or obligations, actions or causes of action whatsoever, for or in connection with, injury or damage (including, but not limited to death) to any person or property arising out of, or in connection with GEFSS's performance of this Agreement and its use and occupancy of the Facilities during the Term, except such injury or damage arising out of the willful misconduct or negligent act or omissions of the District.

6.3 The District agrees to indemnify, defend, save, and hold harmless GEFSS its officers, employees, agents, and independent contractors from and against all manner of claim, demand. debt, lien, loss, damage or liability, cost or expense (including, but not be way of limitation, attorney fees and costs actually incurred, whether or not litigation has commenced), judgments or obligations, actions or causes of action whatsoever, for or in connection with injury or damage (including, but not limited to death) to any person or property arising out of, or in connection with the use of the Facilities by the District or District officers, employees, contractors, agents, or licensees, except where such claims or suits arise out of the willful misconduct or negligent acts or omissions of GEFSS.

7. RIGHT OF TERMINATION

7.1 The District and/or GEFSS may terminate the Agreement due to a material breach of the terms and conditions herein upon fourteen (14) days prior written notice. This notice shall state, with reasonable specificity, the basis of the termination and the actions reasonably necessary to effect a cure, and each party shall have the right to cure the breach. If substantial efforts were made towards curing the breach, one extension of an additional fourteen (14) days shall be granted for additional efforts to cure the breach.

7.2 Either party may terminate this Agreement by written notification thirty (30) days prior to the effective date of the termination. Neither party shall be required to provide just cause for termination in the written notification.

8. TERM OF AGREEMENT

This Agreement is effective beginning June 17, 2019, and ending July 19, 2019, along with the week immediately preceding the start of the Program and the week immediately succeeding the end of the Program ("Term").

9. MISCELLANEOUS

9.1 This Agreement is by and between two independent entities and is not intended to and shall not be construed to create the relationship of agent, servant, employee, partnership, joint venture, or association. Nothing in this Agreement shall be deemed to create an agency, employment, or partnership relationship between the parties. Neither party shall have the right to act for the other party or to bind or commit the other party in any way. Neither party shall have the right to supervise or direct functions of the other hereunder.

9.2 It is mutually agreed that the District has absolutely no authority of any kind concerning any matter, cause, or thing whatsoever in connection with the activities of GEFSS, that has not been specified in the Agreement.

9.3 Changes to the Agreement may be made by mutual written agreement of official representatives of the District and GEFSS.

9.4 All issues relating to this Agreement and the interpretation of this Agreement shall be governed exclusively by the laws of the State of California.

9.5 The waiver by either party of any breach of any term, covenant, or condition herein contained shall not be deemed to be a waiver of such term, covenant, condition, or any subsequent breach of the same or any other term, covenant, or condition herein contained.

9.6 This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, legal representatives, successors, and assigns.

9.7 This Agreement and all amendments and supplements to it may be executed in counterparts, and all counterparts together shall be construed as one document.

9.8 The captions contained in this Agreement are for convenience only and shall not in any way affect the meaning or interpretation hereof nor serve as evidence of the interpretation hereof, or the intention of the parties hereto.

9.9 Should any provision of this Agreement be determined to be invalid, illegal or unenforceable in any respect, such provision shall be severed and the remaining provisions shall continue as valid, legal and enforceable.

9.10 The Recitals and each exhibit attached hereto are hereby incorporated herein by reference.

9.11 Neither party shall assign its rights, duties, or privileges under this Agreement, nor shall either party attempt to confer any of its rights, duties or privileges under this Agreement on any third party, without the written consent of the other party. Subcontracts or subleases may be entered into by GEFSS only with the written authorization of the District. Members of the general public and invitees of GEFSS who enter or use the Facilities as participants or users of the Program are considered "GEFSS" for purposes of determining and applying the rights and obligations of the parties as contained in this Agreement.

10. NOTICE

All notices, demands, or other communications under this Agreement will be in writing. Notice will be sufficiently given for all purposes as follows:

10.1 Personal delivery: When personally delivered to the recipient, notice is effective on delivery.

10.2 Certified mail: When mailed certified mail, return receipt requested, notice is effective on receipt, if delivery is confirmed by a return receipt.

10.3 Overnight delivery: When delivered by an overnight delivery service, charges prepaid or charged to the sender's account: notice is effective on delivery, if delivery is continued by the delivery service.

10.4 Facsimile: When sent by fax to the last fax number of the recipient known to the party giving notice, notice is effective on receipt. Any notice given by fax will be deemed received on the next business day if it is received after 5:00 p.m. (recipient's time) or on a non-business day.

10.5 Addresses for purposes of giving notice are as follows:

DISTRICT: Glendale Unified School District
Stephen Dickinson, Chief Business and Financial Officer
223 No. Jackson Street
Glendale, CA 91206
FAX: 818-546-2101

GEFSS: GEF Summer School, Inc.
Roberta Currier, President, GEF Summer School Inc.
249 N. Brand Blvd., #353
Glendale, CA 91203

Any correctly addressed notice that is refused, unclaimed, or undeliverable because of an act or omission of the party to be notified, will be deemed effective as of the first date the notice was refused, unclaimed, or deemed undeliverable by the postal authorities, messenger, or overnight delivery service. Either party may change its notice information by giving the other party notice of the change in any matter permitted by this Agreement.

11. CONFIDENTIALITY

GEFSS and all GEFSS's agents, consultants, contractors, personnel, and/or employees shall maintain the confidentiality of all confidential information received in the course of performing under the terms of this Agreement. This requirement to maintain confidentiality shall extend beyond the termination of this Agreement.

11.1 During the term of this Agreement, GEFSS may receive from District, or may receive or create on behalf of District, certain confidential information ("CI"). Such information may be provided by District only upon written authorization of any parent(s) of any affected student(s), or any affected adult student, and any employee(s) if such information pertains to such employee(s). GEFSS represents that it has in place policies and procedures that will adequately safeguard any CI it receives or creates, and GEFSS specifically agrees, on behalf of itself, its agents, consultants, contractors, personnel, and/or employees to take reasonable actions to safeguard and protect the confidentiality of CI consistent with applicable law.

11.2 In order to be considered CI, information received from the District must be specifically labeled "Confidential Information." In no event will CI include (a) information which is generally available to the public, (b) information previously authorized to be disclosed for any reason by the District or any of its agents or representatives, (c) information required to be disclosed by any subpoena, court order or other legal process or (d) information obtained by the GEFSS from a source other than the District.

IN WITNESS THEREOF, the authorized representative of the parties have made and executed this Agreement the day and year first written above.

GEF SUMMER SCHOOL, INC.

By: _____ DATE: _____

GLENDALE UNIFIED SCHOOL DISTRICT

By: _____ DATE: _____
Stephen Dickinson, Chief Business & Financial Officer

SCHEDULE A

DISTRICT FACILITIES TO BE USED BY GEFSS

The District Facilities are depicted generally on the diagram attached hereto, and are described generally as follows: rooms, offices, storage room, sets of restrooms, ongoing use of parking lot.

SCHEDULE "B" 2018 FEE SCHEDULE

The GEFSS agrees to pay the District $330 per classroom and $2.50 per enrolled student who physically attends the Facilities in the Summer School Educational Programs operated by GEFSS.

This fee will be used towards the costs of utilities and the use of classrooms, textbooks, technology support servics, copiers, Blackboard Connect, Phone System, and equipment rentals.

#

#

#

#

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 7

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

SUBMITTED BY: Stephen Dickinson, Chief Business and Financial Officer

SUBJECT: **Authorization to Dispose of Surplus Property**

The Interim Superintendent recommends that the Board of Education declare the following textbooks located at Toll Middle School as obsolete and surplus, and authorize disposal in the most cost efficient and environmentally responsible manner.

Quantity	Description	GUSD Bar Code
41	Discovering Food	SBN 0026536560
14	Young Living	SBN 0026428164

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 8

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Dr. Lena Richter, Director, Categorical Programs & Intervention
SUBJECT:	**Quarterly Uniform Complaint Report Summary, Williams Settlement Legislation**

The Interim Superintendent recommends that the Board of Education approve the submission of the Quarterly Uniform Complaint Report Summary, as mandated under the Williams Court Case Settlement, to the Superintendent of the Los Angeles County Office of Education.

Recent legislation regarding the settlement of the Williams Lawsuit requires Local Educational Agencies to file Quarterly Uniform Complaint Report Summaries to the school district Governing Board and to the County Office of Education. The Quarterly Report documents information regarding complaints about instructional materials, facilities, teacher vacancies and mis-assignments.

The Quarterly Uniform Complaint Report Summary for the period of January 1, 2019 through March 31, 2019 is attached and will be sent to the Los Angeles County Office of Education (LACOE).

Facilities Complaint

On March 7, 2019, the District received 34 Williams Complaint forms from a group of parents from Monte Vista Elementary School pertaining to Facilities. The complaints allege that there are no Kinder bathrooms in the FLAG Kinder classrooms; Kinder students are using restrooms that are not height appropriate for their age; Kinder students have to share restrooms with students in grades 1-6; and Kinder students have to walk a far distance to use the restrooms, specifically students in the Kinder FLAG program. A thorough investigation is undergoing and pending resolution.

Los Angeles County Office of Education
Serving Students • Supporting Communities
Leading Educators

Williams Lawsuit Settlement
Quarterly Report on Uniform Complaints 2018-2019

District Name: Glendale Unified Date: 4/2/19

Person completing this form: Carol Corbo Title: Sr. Admin Secretary

Quarter covered by this report (Check One Below):

☐	1st QTR	July 1 to September 30	Due 19-Oct 2018
☐	2nd QTR	October 1 to December 31	Due 18- Jan 2019
☑	3rd QTR	January 1 to March 31	Due 10-Apr 2019
☐	4th QTR	April 1 to June 30	Due 19-Jul 2019

Date for information to be reported publicly at governing board meeting: April 16, 2019

Please check the box that applies:

☐ No complaints were filed with any school in the district during the quarter indicated above.

☑ Complaints were filed with schools in the district during the quarter indicated above. The following chart summarizes the nature and resolution of these complaints.

	Number of Complaints Received in Quarter	Number of Complaints Resolved	Number of Complaints Unresolved
Instructional Materials			
Facilities	34	(investigation undergoing, complaint remedied, resolution pending)	34
Teacher Vacancy and Misassignment			
TOTAL	34		34

Print Name of District Superintendent Dr. Kelly King, Interim Superintendent

Signature of District Superintendent _____ Date _____

Return the **Quarterly Summary** to:
Williams Legislation Implementation Project
Los Angeles County Office of Education
c/o Kirit Chauhan, Williams Settlement Legislation
9300 Imperial Highway, ASM/Williams ECW 284
Downey, CA 90242

Telephone: (562) 803-8382
FAX: (562) 803-8325
E-Mail: Chauhan_Kirit@lacoe.edu

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 9

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

SUBMITTED BY: Felix Melendez, Executive Director, Secondary Education

SUBJECT: **Approval of New Course of Study Outlines for Use in High Schools in the Areas of Career Technical Education and Visual and Performing Arts**

The Interim Superintendent recommends that the Board of Education approve course of study outlines (Robotics 3-4: 3D Design and Manufacturing; Principles of Engineering and Manufacturing 3-4 Honors; Introduction to Engineering Design Technology 1-2; Honors Photography 3-4; Photography Foundations 1-2; and Photography Seminar Honors) for use in high schools in the areas of Career Technical Education and Visual and Performing Arts.

The course outlines have been reviewed for content and evaluated by the members of the Career Technical Education and Visual and Performing Arts Curriculum Study Committees. The Secondary Education Council has reviewed the information and made a recommendation of approval of the course outlines to the Board of Education.

HIGH SCHOOLS

Department: **Career Technical Education**

Course Title: Robotics 3-4: 3D Design & Manufacturing Honors

Grade Level(s): 10-12

School(s) Course Offered: Glendale High School

UC/CSU Approved (Y/N, Subject): Yes, "g" General Elective credits

Course Credits:	10
Recommended Prerequisite:	Robotics 1-2: Introduction to Engineering and Manufacturing
Recommended Textbook(s):	Haas VF / HS Series CNC Machine Programming Workbook, Author: Haas Automation, Publisher: Haas Automation, Edition: 2006 Machining Fundamentals, Author: John R. Walker and Bob Dixon, Publisher: The Goodheart-Willcox Company, Inc., Edition: 10th Edition, 2019
Course Overview:	Robotics 3-4: 3D Design & Manufacturing Honors is the concentrator course (2nd year) in a three course sequence for the Manufacturing and Product Development Industry Sector. The course deepens the skills and knowledge of an engineering student within the context of efficiently creating the products all around us. Students use Computer Aided Design (CAD) experience through the use of Computer Aided Manufacturing (CAM) software. CAM transforms a digital design into a program that Computer Numerical Controlled (CNC) mills, 3D Printers, and laser cutting machines use to transform raw material into a product designed by a student.

Department: **Career Technical Education**

Course Title:	Principles of Engineering and Manufacturing 3-4 Honors
Grade Level(s):	10-11
School(s) Course Offered:	Crescenta Valley High School
UC/CSU Approved (Y/N, Subject):	Pending, “g” College Prep Elective credits
Course Credits:	10

Recommended Prerequisite: 1. Introduction to Engineering Design Technology
2. Grade level math and science

Recommended Textbook(s): Parametric Modeling with Autodesk Fusion 360, SDC Publications, ISBN-13: 978-1630571993, ISBN-10: 1630571997
Principles of Applied Engineering, Pearson
ISBN-13: 978-0-13-470189-9, ISBN-10: 0-13-470189-5

Course Overview: This is the second in a series of three courses in the Engineering and Manufacturing Technology (E&MT) Pathway. It is a "concentrator" course intended to further student knowledge of the engineering profession, especially as it pertains to the design and production of electromechanical devices. This is an academically rigorous course that requires students to master both theory and application. In addition to completing hands-on projects, students will be required demonstrate their knowledge via examination. The first semester of the Principles of Engineering and Manufacturing (PE&M) course begins with augmenting the students' skills in the use of computer aided design software and the production of technical drawings. Later the first semester, students will build on their basic understanding of mechanical and electrical systems by incorporating additional concepts, including basic structural principles, material science, and manufacturing processes. The course continues in the second semester with more advanced topics in electromechanical power transmission, and an introduction to systems engineering. Students will learn to use systems modeling software, and incorporate more advanced machine control programming techniques. By the conclusion of the second year, students will be able to conceive, describe, document, and then construct complex computer-controlled electromechanical systems, such as industrial robotics.

Department: Career Technical Education

Course Title: Introduction to Engineering Design Technology 1-2

Grade Level(s):	9-10
School(s) Course Offered:	Crescenta Valley High School
UC/CSU Approved (Y/N, Subject):	Pending, "g" College Prep Elective credits
Course Credits:	10
Recommended Prerequisite:	Grade level math and science
Recommended Textbook(s):	Parametric Modeling with Autodesk Fusion 360, SDC Publications, ISBN-13: 978-1630571993, ISBN-10: 1630571997 Principles of Applied Engineering, Pearson ISBN-13: 978-0-13-470189-9 ISBN-10: 0-13-470189-5
Course Overview:	This is the first in a series of three courses in the Engineering and Manufacturing Technology (E&MT) Pathway. It is an exploratory course intended to introduce students to the engineering profession, in general, with a specific emphasis on electromechanical product design. The first semester of the Introduction to Engineering Design Technology (IEDT) course begins with developing the students' skills in design thinking, sketching techniques, measurement, and statistical analysis. Students will also learn the basics of solid modeling and technical drawing production. The course continues in the second semester with an introduction to mechanical systems, electrical circuits, and concludes with machine control programming skills. By the conclusion of the first year, students will be able to conceive, describe, document, and then construct simple computer controlled electromechanical devices, such as an automated guided vehicle (AGV).

Department: **Career Technical Education / Visual and Performing Arts**

Course Title:	Honors Photography 3-4
Grade Level(s):	10 - 12
School(s) Course Offered:	Hoover High School
UC/CSU Approved (Y/N, Subject):	Yes, "f" Fine Art credits
Course Credits:	10
Recommended Prerequisite:	B or better in Photography 1-2 This course is a recommended prerequisite for AP Studio Arts; Art Seminar
Recommended Textbook:	Focus on Photography, ISBN 10: 0-87192-721-7 The Visual Experience, ISBN: 978-08719-2627-2
Course Overview:	This course is designed for advanced photography students who wish to push their creative potential by exploring and experimenting with the ideas and practices of 21st century art. Students will focus on the connections between conceptual and technical aspects of their photographic practice and develop personal themes. Emphasis is placed on understanding of concept and technique, critique processes, evaluation utilizing the Elements and Principle of Art Making, research of art historical figures, and professional practice. Students are required to maintain a sketchbook, which will include weekly drawing assignments and preliminary studies of projects. In addition to creating portfolio artworks, all assignments throughout the course will require students to analyze, critique, and discuss the meaning and purpose of various artworks and how the artists employ the elements of art and principles of design to communicate meaning. The course will culminate with the completion of a digital and physical portfolio of artwork, artist statement, and resume.

Department:	**Career Technical Education / Visual and Performing Arts**
Course Title:	Photography Foundations 1-2
Grade Level(s):	9-12
School(s) Course Offered:	Hoover High School
UC/CSU Approved (Y/N, Subject):	Pending, "f" Fine Arts credit
Course Credits:	10
Recommended Prerequisite:	This course is a recommended prerequisite for Photography 3-4 and AP Photography
Recommended Textbook:	Focus on Photography, ISBN 10: 0-87192-721-7 The Visual Experience, ISBN: 978-08719-2627-2
Course Overview:	This course will introduce the student to Photography as an artistic medium for personal expression as well as a commercial medium. The basic use of cameras (35 mm and digital), film, darkroom development and digital imaging will be taught. Composition, communication, and critical thinking will be combined with continual self and class evaluation. Students will be exposed to historical and cultural uses of photography with the goal of incorporating these concepts into their own work. Students will explore careers in photography performing these roles. Students will complete this course with the key technological skills appropriate for occupations in the arts industry. Students will prepare a portfolio of their original works for college application, job application and/or personal collection. Photo 1-2 fulfills the F requirement, Career Prep graduation requirement, and Elective/G requirements (consecutively).

Department: **Career Technical Education / Visual and Performing Arts**

Course Title:	Photography Seminar Honors
Grade Level(s):	11-12
School(s) Course Offered:	Hoover High School
UC/CSU Approved (Y/N, Subject):	Yes, "f" Fine Art credits
Course Credits:	10
Recommended Prerequisite:	Photo 1-2 and AP Studio Art or Honors Photography 3-4
Recommended Textbook:	Focus on Photography, ISBN 10: 0-87192-721-7 The Visual Experience, ISBN: 978-08719-2627-2
Course Overview:	Studio Art Seminar Honors is a coursed designed to provide students in the Studio Art pathway a fourth year course to work on specific projects and work-based learning opportunities in career training. This course is designed to allow fourth-year studio art students the chance to build their portfolio for college applications, internships, and professional presentation. Assignments will focus on visual problem solving, creative thinking and self-expression. Students will continue development of portfolio by pursuing an area of focus (subject, topic/theme or genre), and continued development of their artistic voice and style in a variety of selected media. This area of focus will be a yearlong, in-depth study. By the end of this course it is expected that students will have a cultivated portfolio that showcases the breadth of their artistic skills and interests, as well as their ability to sustain a more in-depth creative exploration. Students are required to maintain a sketchbook, which will include weekly drawing assignments and preliminary studies of projects. In addition to creating portfolio artworks, all assignments throughout the course will require students to analyze, critique, and discuss the meaning and purpose of various artworks and how the artists employ the elements of art

and principles of design to communicate meaning and feeling. This class is project based and hands on. Emphasis is placed on understanding of critique processes, evaluation utilizing the Elements and Principle of Art Making, research of art historical figures, and professionalism of finish product. The class will culminate with a gallery exhibition developed, organized, and executed by the students.

Glendale Unified School District School

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Career Technical Education
Course Title:	Robotics 3-4: 3D Design & Manufacturing Honors
Course Code:	(*Educational Services will assign course number **after** Board Approval)*
Grade Level(s):	10-12
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	Yes, "g" General Elective credits
Course Credits:	10
Recommended Prerequisite:	Robotics 1-2: Introduction to Engineering and Manufacturing
Recommended Textbook(s):	Haas VF / HS Series CNC Machine Programming Workbook, Author: Haas Automation, Publisher: Haas Automation, Edition: 2006 Machining Fundamentals, Author: John R. Walker and Bob Dixon, Publisher: The Goodheart-Willcox Company, Inc., Edition: 10th Edition, 2019
Course Overview:	Robotics 3-4: 3D Design & Manufacturing Honors is the concentrator course (2nd year) in a three course sequence for the Manufacturing and Product Development Industry Sector. The course deepens the skills and knowledge of an engineering student within the context of efficiently creating the products all around us. Students use Computer Aided Design (CAD) experience through the use of Computer Aided Manufacturing (CAM) software. CAM transforms a digital design into a program that Computer Numerical Controlled (CNC) mills, 3D Printers, and laser cutting machines use to transform raw material into a product designed by a student.

First Semester-Course Content

Unit 1: **Machine Shop Safety** (*2 weeks*)

STANDARDS
Anchor Standards: 6.2, 6.3, 6.4, 6.7
Pathway Standard: B7.1, B10.1
Common Core Standards: S-ID-1, S-IC-6

A. In this unit, general lab safety is covered as well as personal protective equipment and safety precautions before, during, and after the machining process. General lab safety instruction includes lessons about evacuation routes and procedures, maintaining a clean and orderly workspace, use of compressed air, and locations of first-aid kits and fire extinguishers. The lesson on personal protective equipment discusses eye and ear protection, proper work attire, respiratory protection, and entanglement hazards. After the general safety and personal protective equipment lessons, students are taught safety practices used before machining. Students then learn about safety precautions during machining such as avoiding distractions, maintaining one operator in control, and keeping hands away from machines that are powered on. All students must pass a safety test before being allowed to work in the lab.

B. Students are frequently presented with quizzes and test questions. The questions are typically true/false, multiple choice, or multiple selection in nature and often include written questions, visual diagrams and interactive web-based activities.

Unit 2: **Foundational Mathematics** (*1 week*)

STANDARDS
Anchor Standard: 5.1, 5.2,
Pathway Standard: B3.3, B7.4
Common Core Standards: 11-12.10, F-IF-4

A. The foundational mathematics unit includes numerous lessons and exercises on mathematical concepts and techniques necessary for performing measurements and estimations and for performing calculations in a manufacturing environment in general. For that reason, the unit begins with instruction on the basic skills of rounding decimal numbers and arithmetic order of operations. Although students have already learned these low level skills in prior math classes, the review reinforces a strong understanding and builds student confidence to a point where these simple mathematical operations can be applied quickly and mentally in a manufacturing environment, without the need to refer to a textbook or notes.

B. Students are frequently presented with quizzes and test questions. The questions are typically true/false, multiple choice, or multiple selection in nature and often include written questions, visual diagrams and interactive web-based activities.

Unit 3: **Applied Geometry and Trigonometry** *(2 weeks)*

STANDARDS
Anchor Standard: 5.1, 5.2,
Pathway Standard: B3.3, B7.4
Common Core Standards: C-14, RSTL-11-12.3

A. The applied geometry and trigonometry unit provides students a solid foundation of mathematical knowledge necessary for interpreting engineering drawings. The unit begins with instruction on geometric concepts of parallel, perpendicular, and bisecting lines, and then moves to defining polygons and calculating perimeter, and then defining circles and calculating circumference, diameter, and radius. Finally, students learn about the unit circle, and how to recognize standard position angles, and how to find the coordinates of points along the unit circle which occur at standard position angles. By building knowledge and skills in geometry and trigonometry, students are better prepared to interpret engineering drawings and perform calculations needed to find unknown dimensions, locations, or measurements.

B. Students are frequently presented with quizzes and test questions. The questions are typically true/false, multiple choice, or multiple selection in nature and often include written questions visual diagrams and interactive web-based activities.

Unit 4: **Measuring Tools** *(5 weeks)*

STANDARDS
Anchor Standard: 8.1, 8.7, 10.1, 10.2, 11.1
Pathway Standard: B1.0, B1.2, B2.4, B3.3, B7.4, B11.0, B11.5
Common Core Standards: S-ID-1, WS-11.12.8

A. In the Measuring Tools Unit students learn every workpiece must be designed and manufactured accurately to size within close limits. The student gains insight on how careful measuring of the workpiece is necessary to insure proper fit and satisfactory operation of each part when it is assembled with other parts. Inaccurate and careless measurements are worthless. A good design engineer and manufacture must be responsible for accurate work. Students must be able to use measuring tools with speed and accuracy as discussed in this unit.

B. Students are each given a unique machined and 3d printed components and are asked to perform various measurements such as length, thickness, and diameter on different geometric features of the component. Students record their measurements to a page. Each student then exchanges their component with one

given to a different student, and performs the activity again, independently taking measurements of a different component. The students compare notes with each other, and clear up any points of discrepancy or confusion by demonstrating the technique used to measure and to read the measurement, and validating their procedure with the instructor.

Unit 5: **Engineering Drawing Interpretation** *(3 weeks)*

STANDARDS
Anchor Standard: 2.1, 2.2, 2.5, 3.6, 5.3,
Pathway Standard: B1.0, B1.1, B1.4
Common Core Standards: N-Q-2, N-Q-3

A. In this unit, students learn how to interpret engineering drawings and the role they play in manufacturing both in conjunction with and aside from digital solid model data. The unit begins with an overview of ANSI and ISO as two different standards organizations, each with fundamentally different standards for presenting model data views in an engineering drawing. Students also learn how to read and interpret other drawing attributes such as the title block, notes, callouts, and line styles. The unit then teaches different methods of dimensioning including location and datum dimensioning and where each is applicable. Finally, tolerancing is discussed in concept, style, and interpretation. Students learn classical unilateral, bilateral, and block tolerancing styles and learn a basic introduction to geometric dimensioning and tolerancing as defined by the ASME Y14.5-2009 standard. Finally, students learn how tolerance can affect the fitment of mating pieces and why tolerance must be considered to prevent ambiguous fitment when either a clearance fit or interference fit is desired.

B. Students are provided a tangible three-dimensional model of an object featuring multiple surfaces, edges, steps, and holes. The students then determine which orientation to classify as the front view, and proceed to sketch it by hand along with the other five orthographic projections. Students sketch the projected views following both ANSI third-angle and ISO first-angle standards. The drawings are checked for accuracy in relative scale and for proper representation of the part using geometry lines and hidden lines. The forward approach to drawing creation beginning with the 3D model assists students in developing the spatial skills needed to visualize a 3D component from its representation as 2D views when following the reverse approach of interpreting provided engineering drawings in later coursework.

Unit 6: **CNC Tools and Speed and Feed Calculation** *(2 weeks)*

STANDARDS
Anchor Standard: 3.1, 4.5, 7.4, 10.1
Pathway Standard: B2.5, B3.3, B7.4, B10.1
Common Core Standards: S-ID-1, RSL 11-12.4. RSIT 11-12.7.

A. This unit begins with an overview of the various types of commonly-used tools found in CNC machining such as end mills, drills, taps, and corner rounding tools. Types of tool materials such as carbide and high speed steel are discussed as well as tool geometry including the number of cutting flutes. The theory of chip formation in the cutting process is briefly discussed, to the extent necessary to understand how chip load is affected by other cutting parameters such as feed and speed. Common cutting speeds measured in units of surface feet per minute for various materials are presented, and students build an understanding of how and why cutting speeds are driven by material properties. Students learn and practice using the mathematical equations for calculating speed and feed rate in both milling and turning operations. Finally, students learn how to calculate tapping operation feed rates based upon spindle speed and thread pitch.Students are frequently presented with quizzes and test questions. The questions are typically true/false, multiple choice, or multiple selection in nature and often include written questions as well as visual diagrams.

B. Unit Assignment: Revise product proposal to include the development steps, tools and equipment in creating the selected object. Proposal will explain the cutting speeds utilized and reasons why those cutting speeds were selected.

Unit 7: **3-Axis CNC Milling Machine Setup and Operation** *(7 weeks)*

STANDARDS
Anchor Standard: 1.0, 2.1, 2.3, 4.1, 4.4, 5.1, 5.2, 9.2, 9.7, 10.3
Pathway Standard: B2.0, B2.1, B2.2, B5.9, B6.1, B10.0, B10.1, B10.4
Common Core Standards: SEP-5, A-CED-2, G-CO-2

A. In this unit, students learn how to safely and effectively setup and operate a Haas CNC mill in depth. The unit begins with an overview of machine kinematics including definition and direction of the three axes of motion. Students then learn about the nine organizational groupings of keys on the Haas control panel and how each is effectively used in the setup and operation of the machine, and take an in depth look at the operational modes such as edit, memory, and handle jog. Students learn and demonstrate pre-startup procedures such as checking coolant, oil, grease, and air pressure levels, perform the machine powerup and reset procedure, and initiate a spindle warm up program. After learning about the control panel and how to power on the machine, students practice basic manual operations such as loading, changing, and unloading tools, and handle jogging the machine in each of the three axes. After the workpiece is setup and offsets are

determined, students use machine control editor to insert and alter G and M program codes both from a manuscript as well as from an external data storage device, and demonstrate how to simulate a program in graphics mode on the control.

B. Through the skills assessment checklist, students demonstrate their practical knowledge and skills while operating the CNC milling machine. When students are ready to demonstrate their skills, the instructor joins him or her standing at the CNC milling machine in the lab for a one-on-one interview and assessment of skills. The interview and skills assessment typically takes place over four class sessions spanning over a period of approximately 7 weeks. Eight primary modules from Unit 7 are addressed on the checklist: machine motion, control panel layout and organization, machine start-up procedure, basic manual operations, edit capabilities, program entry, and program run. Each proficiency check prompt is given to the student verbally during the interview and assessment, and the student is not allowed the use of any notes or references during the assessment. Students must pass every proficiency item to a satisfactory level to earn the industry-recognized certification for this unit. A passing mark indicates that the student has demonstrated confidence with the information they communicate or the skill they demonstrate to the instructor.

Second Semester-Course Content

Unit 8: **3-Axis CNC Milling Machine Programming** *(7 weeks)*

STANDARDS
Anchor Standard: 1.0, 2.1, 2.3, 4.1, 4.4, 5.1, 5.2, 9.2, 9.7, 10.3
Pathway Standard: B5.9, B6.1, B10.0, B10.1, B10.4
Common Core Standards: SEP-6, A-CED-2, G-CO-2

A. In the milling machine programming unit, students learn the fundamental G and M codes used to command the motions and operations of the Computer Numerically Controlled milling machine. A primary curricular aide used during instruction for this unit is the Haas Mill Programming Workbook and Immerse2Learn interactive web-based material. Students begin with a positioning exercise to check for understanding of Cartesian coordinates and to demonstrate the difference between absolute and incremental positioning techniques. Program structure is presented highlighting standard sets of commands used at the beginning and end of each program and operation. Then, students learn the commands for linear and circular interpolation and the syntax of each before completing an exercise in which they write a program to command a cutting tool to follow a drawn part profile with both linear and circular features. Once students are familiar with all the major elements of the CNC mill programming language, they complete a project to hand-code a five-operation program to produce a part specified by a provided engineering drawing. The proficiencies students gain in

this unit comprise the industry-recognized certificate in 3-Axis CNC Milling Machine Programming.

B. In this assignment, students apply their knowledge of CNC machine programming in the G and M code language by hand-programming a part specified by a printed engineering drawing and produced on the 3-Axis vertical CNC milling machine. Students may use either the machine control or a simple text editor to write the code, but are not allowed to generate the code by any automated CAM software or process. Students may collaborate with each other to some degree, however their programs must reflect significant individual effort and time spent. Development, refinement, and test-running of the program code on a simulator typically occurs over approximately seven 45-minute class periods from start to finish of the assignment. While developing the program code comprises one assignment on its own, setting up and running the program on the machine is a separate assignment detailed in Unit 7 above.

Unit 9: **2.5D Toolpath Strategies** *(5 weeks)*

STANDARDS
Anchor Standard: 1.0, 2.1, 2.3, 4.1, 4.4, 5.1, 5.2, 9.2, 9.7, 10.3
Pathway Standard: B5.9, B6.1, B10.0, B10.1, B10.4
Common Core Standards: ETS1.A, ETS1.B, ETS1.C

A. Students learn how to use advanced Computer-Aided Manufacturing (CAM) software to import solid model data from a Computer-Aided Design (CAD) program to create advanced toolpaths which are then posted as thousands of lines of G code used to control the machine. Students learn how to select toolpath cutting strategies based upon part geometry and the types of tools used. I The difference between constant-engagement (high speed) toolpaths and traditional toolpaths is emphasized, and students gain an understanding of the shortcomings of traditional toolpaths in producing parts with tight-radius pocket features. For each operation, speeds and feed rates are analyzed in depth using an advanced calculation tool, which builds upon experience gained in Unit 6. Students learn how to adjust cutting parameters such as stepover and depth to maximize material removal rates while ensuring the strength and capabilities of the machine and cutting tool are utilized to their fullest extents, but not exceeded. After optimizing cycle times for efficiency, students gain a sense of understanding that in a production environment, the time it takes to produce a part is directly related to the economics of the company's business model and to the price point of the product sold to a distributor or to the end consumer.

B. MasterCAM Program: In this assignment, students are given a solid CAD model of a part with a variety of features that can be created using 2.5D machining strategies. Students must select and apply the appropriate tooling, toolpath strategies and order of operations to produce the part from raw material of a specified size. Within each operation, students must determine and apply the

appropriate depths, cutting increments, stepover distances, and toolpath entry and exit styles. The total estimated cycle time is analyzed as well as the cycle time for each machining operation, and speeds and feed rates are optimized using an advanced calculation tool.

Unit 10: **3D Toolpath Strategies** *(4 weeks)*

STANDARDS
Anchor Standard: 1.0, 2.1, 2.3, 4.1, 4.4, 5.1, 5.2, 9.2, 9.7, 10.3
Pathway Standard: B5.9, B6.1, B10.0, B10.1,B10.3, B10.4
Common Core Standards: ETS1.A, ETS1.B, ETS1.C

A. This unit expands upon the previous by teaching students how to produce advanced toolpath strategies which utilize simultaneous motion of all three axes. Students quickly realize that the variety and detail of parts that can be produced using 3D strategies far surpasses what is possible using 2.5D strategies. The abilities and limitations of cutting tools to produce certain geometric features using various approaches is discussed, and the concepts of tolerance and surface finish quality are presented as factors which are inversely proportional to production time and cost. Students run 3D virtual simulations of the 3D toolpaths and make comparisons between a virtually-machined component and the original solid model to determine what areas may need different or additional finishing strategies applied. The concept of rest-machining is introduced and applied, and the simulation is repeated through multiple iterations until proper results are achieved. Once the part is programmed, verified, and optimized, students produce it from raw materials on the 3-axis CNC milling machine and check for proper outcomes.

B. The 3D part is machined with adaptive roughing strategies using a flat end mill and a variety of 3D contouring and surfacing strategies using a ball end mill. All programming will be done through MasterCAM software. Students need to apply different types of finishing toolpaths to areas of different 3D geometry such as conical and spherical surfaces as well as surfaces of uniform cross section whose curve appears in a cross section taken in the XZ or YZ plane.

Unit 11: **Manufacturing as a Career** *(4 weeks)*

STANDARDS
Anchor Standard: 11.1, 11.2, 11.4
Pathway Standard: B1.4, B3.3, D1.0, D1.1, D10.0, D10.2
Common Core Standards: ETS2, ETS2.A, ETS2.B

A. In this unit, students come to realize that entering a career in manufacturing is not about the grungy repetitive, monotonous work of decades past, but involves highly skilled occupations that take place in very clean, high-tech environments and require a great variety of knowledge and skills to perform successfully.

Students also realize that highly skilled individuals in the manufacturing industry can earn wages considerably higher than in many other industries. Students conduct research on various types of manufacturing employers and occupations and report back with their findings. Additionally, students develop a personal resume indicating their skills and certifications gained through the class. Students gain valuable insight into manufacturing as a career either through a field trip to a manufacturing facility or by a professional in the manufacturing industry visiting the class as a guest speaker.

B. Professional Resume: In this assignment, students use word processing software to write and format a professional resume that can later be used to assist in gaining entry level employment in the manufacturing industry sector. The resume lists the student's occupational objective, educational experience, software skills, hands-on skills, and certifications. The resumes are checked for proper spelling, grammar, diction, and formatting.

Final Project/Exam:

1. Students will download 10 solid part files from Titan academy and program tool paths with MasterCAM. Once approved by the instructor, students will machine multiple operation parts on a Haas CNC -mill. This hands on task will serve as the course final. In addition, students further develop and enhance their Manufacturing and Product Design Notebooks and Portfolios. Students exhibit their work and reflect on their learning before a panel of industry partners.
2. Assignments: Update Professional Resume and Cover Letter- Each student updates her/his professional resume and cover letter for inclusion in her/his Manufacturing and Product Development portfolios.
3. Professional Interview- At the conclusion of the course, students engage in a formal interview with a manufacturing partner and receive feedback on their skills and abilities.
4. Exhibition of Learning –Each student prepares and delivers an exhibit of her/his learning and accomplishments to a panel of industry partners. The exhibition of learning features evidence of growth in college and career readiness, student reflections on learning, as well as the final project and samples of work featured in the student's course notebook and portfolio.

Additional Course Materials:
Title: Immerse2Learn
Author/Editor/Compiler: i2L
Affiliated Institution or Organization: US Dept of Labor
URL: http://web.immerse2learn.com/web/my- login/

Title: OHSA
Author/Editor/Compiler: Various Contributors - US Department of Labor
Affiliated Institution or Organization: US Dept of Labor
URL: https://www.osha.gov/

Glendale Unified School District School

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Career Technical Education
Course Title:	Principles of Engineering and Manufacturing 3-4 Honors
Course Code:	(*Educational Services will assign course number **after** Board Approval)*
Grade Level(s):	10-11
School(s) Course Offered:	Crescenta Valley High School
UC/CSU Approved (Y/N, Subject):	Pending, "g" College Prep Elective credits
Course Credits:	10
Recommended Prerequisite:	1. Introduction to Engineering Design Technology 2. Grade level math and science
Recommended Textbook(s):	Parametric Modeling with Autodesk Fusion 360, SDC Publications, ISBN-13: 978-1630571993, ISBN-10: 1630571997 Principles of Applied Engineering, Pearson, ISBN-13: 978-0-13-470189-9, ISBN-10: 0-13-470189-5
Course Overview:	This is the second in a series of three courses in the Engineering and Manufacturing Technology (E&MT) Pathway. It is a "concentrator" course intended to further student knowledge of the engineering profession, especially as it pertains to the design and production of electromechanical devices. This is an academically rigorous course that requires students to master both theory and application. In addition to completing hands-on projects, students will be required demonstrate their knowledge via examination. The first semester of the Principles of Engineering and Manufacturing (PE&M) course begins with augmenting the students' skills in the use of computer aided design software and the production of technical drawings. Later the first semester, students will build on their basic understanding of mechanical and electrical systems by incorporating

additional concepts, including basic structural principles, material science, and manufacturing processes. The course continues in the second semester with more advanced topics in electromechanical power transmission, and an introduction to systems engineering. Students will learn to use systems modeling software, and incorporate more advanced machine control programming techniques. By the conclusion of the second year, students will be able to conceive, describe, document, and then construct complex computer-controlled electromechanical systems, such as industrial robotics.

First Semester-Course Content

Unit 1**:** Introduction to Reverse Engineering and Parametric Modeling *(6 weeks)*

STANDARDS
CTE Anchor Standards: 2.4, 4.1, 4.2, 5.4
CTE Pathway Standards (Engineering & Architecture; Manufacturing & Product Dev**.)**

- Engineering Design (B), Engineering Technology (C): C2.1, C2.2, C3.1, C3.2, C3.3, C5.1, C4.1, C4.2, C5.2, C5.4, C5.5, C6.1, C6.2
- Machining & Forming Tech. (B), Product Innovation & Design (D): D1.1, D1.2, D4.2

Common Core ELA: AS.W.2, AS.W.8, AS.SL.4, AS.L.6, 9-10.W.2.d, 9-10.RST.4, 9-10.RST.8
Common Core Math: G.MG.1, N.Q.1, N.Q.2, N.Q.3, S.ID.1, S.ID.4, S.ID.6, S.ID.6c, S.ID.7, S.ID.8
NGSS HS: HS.ETS.1.4

- DCI: ETS1.B
- SEP**:** Obtaining, Evaluating, and Communicating Information; Defining problems; and Developing and Using Models
- CCC: Structure and Function

Unit 1 exposes students to the application of engineering principles and practices needed to successfully "reverse engineer" a relatively complex mechanical device. Reverse engineering involves disassembling and analyzing a product or system in order to understand and document the visual, functional, and/or structural aspects of its design. They will perform a functional analysis to hypothesize the overall function and sequential operations of the product's component parts and assess the inputs and outputs of the process(es) involved in the operation of the product. Students will physically disassemble the product to document the constituent parts, their properties, and their interaction and operation. After carefully documenting these aspects of the visual, functional, and structural aspects of the product, students will assess the strengths and weaknesses of the product and the manufacturing process by which it was produced. Finally, students will be able to fully model the device using computer aided design (CAD) software and be able to scale its components in size.

At the completion of Unit 1, Students will be able to:

1. Identify and describe the visual principles and elements of design apparent in a natural or man-made object.
2. Describe the process of reverse engineering.

3. Explain the various reasons to perform reverse engineering including discovery, documentation, investigation, and product improvement.
4. Explain how the visual elements and principles of design affect the aesthetics and commercial success of a product.
5. Perform a functional analysis of a product in order to determine the purpose, inputs and outputs, and the operation of a product or system.
6. Perform a structural analysis of a product in order to determine the materials used and the form of component parts as well as the configuration and interaction of component parts when assembled.

Unit Assignment:
At the conclusion of unit one, students will have created a solid model of a real-world product that has multiple and varied interchangeable parts, as they did for the project in unit 4 of the first year, only now it will have greater complexity, requiring the use of many more of the solid modeling functions in CAD software. The modeled product will be able to be scaled up or down, and reproduced at a different size.

Unit 2: **Engineering Documentation** *(8 weeks)*

STANDARDS
CTE Anchor Standards: 2.4, 4.1, 4.2, 5.4
CTE Pathway Standards (Engineering & Architecture; Manufacturing & Product Dev**.)**

- Engineering Design (B), Engineering Technology (C): C2.1, C2.2, C3.1, C3.2, C3.3, C5.1, C4.1, C4.2, C5.2, C5.4, C5.5, C6.1, C6.2, C7.1, C7.2, C8.1, C8.2, C9.1, C9.2, C9.3
- Machining & Forming Tech. (B), Product Innovation & Design (D):

Common Core ELA: AS.L.6, 9-10.W.2.d, 9-10.RST.4
Common Core Math: G.MG.1, N.Q.1, N.Q.2, N.Q.3
NGSS HS: HS.ETS.1.4

- DCI: ETS1.B
- SEP**:** Obtaining, Evaluating, and Communicating Information; Defining problems; and Developing and Using Models
- CCC: N/A

Unit 2 will enhance students' basic knowledge of technical drawing representations learned in year one of the pathway to include the creation of alternate (section and auxiliary) views and appropriate dimensioning and annotation of technical drawings. Students will also be introduced to the reality of variation in dimensional properties of manufactured products. They will learn the appropriate use of dimensional tolerances and alternate dimensioning methods to specify acceptable ranges of the physical properties in order to meet design criteria. Students will apply this knowledge to create engineering working drawings that document measurements collected during a reverse engineering process. These skills will also allow students to effectively document a proposed new design. Students will use 3D computer modeling software to model the assembly of the consumer product, as such a model can be used to replicate functional operation and provide virtual testing of product design.

At the completion of Unit 2, Students will be able to:

1. Identify line types (including construction lines, object lines, hidden lines, and center lines) used on a technical drawing per ANSI Line Conventions and Lettering and explain the purpose of each line.
2. Identify general rules for dimensioning on technical drawings used in standard engineering practice.
3. Identify and differentiate between size dimensions and location dimensions.
4. Identify and correctly apply chain dimensioning or datum dimensioning methods to a technical drawing.
5. Identify dimensioning standards commonly used in technical drawing.
6. Identify the shapes of two-dimensional cross sections of three dimensional objects.
7. Identify, define and explain the proper use of a section view in technical drawing.
8. Read and interpret a hole note to identify the size and type of hole including through, clearance, blind, counter bore, and countersink holes.
9. Identify and differentiate among limit dimensions, a unilateral tolerance, and a bilateral tolerance.
10. Differentiate between clearance and interference fit.
11. Explain each assembly constraint (including mate, flush, insert, and tangent), its role in an assembly model, and the degrees of freedom that it removes from the movement between parts.
12. Generate section views using CAD according to standard engineering practice.
13. Dimension a section view of a simple object or part according to a set of dimensioning standards and accepted practices.
14. Annotate (including specific and general notes) working drawings according to accepted engineering practice. Include dimensioning according to a set of dimensioning rules, proper hole and thread notes, proper tolerance annotation, and the inclusion of other notes necessary to fully describe a part according to standard engineering practice.
15. Create specific notes on a technical drawing to convey important information about a specific feature of a detailed object, and create general notes to convey details that pertain to information presented on the entire drawing (such as units, scale, patent details, etc.)
16. Model and annotate (with a hole note) through, clearance, blind, counter bore, and countersink holes.
17. Compare the effect of chain dimensioning and datum dimensioning on the tolerance of a particular specified dimension.
18. Determine the specified dimension, tolerance, upper limit, and lower limit for any given dimension and related tolerance (or any distance that is dependent on given dimensions) shown on a technical drawing.
19. Determine the allowance between two mating parts of an assembly based on dimensions given on a technical drawing.
20. Identify the type of fit given a drawing, a description, or a physical example of two mating parts.
    1. Create assemblies of parts in CAD and use appropriate assembly constraints to create an assembly that allows correct realistic movement among parts. Manipulate the assembly model to demonstrate the movement.

2. Create a CAD assembly drawing. Identify each component of the assembly with identification numbers and create a parts list to detail each component using CAD

Unit Assignment:
This key student project involves the production of a full set of professional-grade engineering drawings for a (student created) mechanical assembly of greater complexity then as yet encountered. These drawings will require a much greater degree of detail then any previous drawing produced by the students. The mechanical parts in the assembly will carry much more stringent requirements for both accuracy and precision, with drawings produced that must reflect this increased attention to detail.

Unit 3: **Intro to Computer Aided Manufacturing** *(4 weeks)*

STANDARDS
CTE Anchor Standards: 2.4, 4.1, 4.2, 5.4
CTE Pathway Standards (Engineering & Architecture; Manufacturing & Product Dev**.)**
- Engineering Design (B), Engineering Technology (C): B7
- Machining & Forming Tech. (B), Product Innovation & Design (D): B1, B2, B3, B10, B11, D4, D6

Common Core ELA: N/A
Common Core Math: N/A
NGSS HS: N/A

Unit 3 introduces students to material forming, machining and additive manufacturing processes. Students will learn to determine what manufacturing processes are appropriate for a given application and then select material and set-up machine tools accordingly to produce a mechanical part to specifications. Students will learn to write computer numerical control (CNC) programs that will guide machine tools.

At the completion of Unit 3, students will be able to:
1. Use engineer design knowledge to analyze products with flaws and use solid modeling software to improve the design.
2. Select the appropriate manufacturing process when given a production problem and identify the process that a given machine would perform to bring the product into existence.
3. Determine the appropriate speed rate for a given material using a tool with a given diameter.
4. Determine the feed rate for a given material using a tool with a given diameter.
5. Read and interpret G & M codes and create numerical code using a CAM program.
6. Transfer the drawings made in CAD to a CAM program and verify the planned creation of a mechanical part using CAM simulation software, then produce the parts using the corresponding machines tools.

Unit Assignment:
The Unit 3 key project will include the production of a an appropriately complex physical part that was designed as a solid model by the students using CAD software and then imported into CAM software for the purposes of CNC milling via a series of student programmed tool paths.

Second Semester-Course Content

Unit 4: **Introduction to Materials and Structures** *(4 weeks)*

STANDARDS
CTE Anchor Standards: 2.4, 4.1, 4.2, 5.4
CTE Pathway Standards (Engineering & Architecture; Manufacturing & Product Dev**.)**
- Engineering Design (B), Engineering Technology (C): B4.1, B4.2, B4.3, B4.4, B4.5, B5.1, B5.2, B5.3, B5.4, B5.5
- Machining & Forming Tech. (B), Product Innovation & Design (D): N/A

Common Core ELA: AS.W.2, AS.W.8, AS.SL.4, AS.L.6, 9-10.W.2.d, 9-10.RST.4, 9-10.RST.8
Common Core Math: G.MG.1, N.Q.1, N.Q.2, N.Q.3, S.ID.1, S.ID.4, S.ID.6, S.ID.6c, S.ID.7, S.ID.8
NGSS HS: HS.ETS.1.4
- DCI: ETS1.B
- SEP**:** Obtaining, Evaluating, and Communicating Information; Defining problems; and Developing and Using Models
- CCC: Structure and Function

Unit 4 introduces students to relevant material properties for engineering purposes and the calculations necessary to determine the forces acting on structures when they are in static equilibrium. In this unit student will conduct tests on various material to determine whether a design is reliable, safe, and predictable in function. Student will learn the two major categories: destructive testing and nondestructive testing.
At the completion of Unit 2, Students will be able to:

1. Investigate specific material properties related to common mechanical devices.
2. Conduct investigative non-destructive material property tests on selected common household products. Property testing conducted to identify continuity, ferrous metal, hardness, and flexure.
3. Create free body diagrams of objects, identifying all forces acting on the object.
4. Mathematically locate the centroid of structural members.
5. Calculate moment of inertia of structural members.
6. Differentiate between scalar and vector quantities.
7. Identify magnitude, direction, and sense of a vector, and calculate the X and Y components given a vector.
8. Calculate moment forces given a specified axis.
9. Use equations of equilibrium to calculate unknown forces.
10. Use the method of joints strategy to determine forces in the members of a statically determinate truss.

Unit Assignment:
At the conclusion of unit four, student will engage in a bridge building competition using inexpensive material. The student projects will then be load-tested to determine the strength of the structures.

Unit 6: **Advanced Machine Control** *(8 weeks)*

STANDARDS
CTE Anchor Standards: 2.4, 4.1, 4.2, 5.4
CTE Pathway Standards (Engineering & Architecture; Manufacturing & Product Dev**.)**
- Engineering Design (B), Engineering Technology (C): B8.1, B8.2, B8.3, B8.4, B8.5, B8.6
- Machining & Forming Tech. (B), Product Innovation & Design (D): N/A

Common Core ELA: N/A
Common Core Math: G.MG.1, N.Q.1, N.Q.2, N.Q.3, S.ID.1, S.ID.4, S.ID.6, S.ID.6c, S.ID.7, S.ID.8
NGSS HS: HS.ETS.1.4
- DCI: ETS1.B
- SEP**:** Obtaining, Evaluating, and Communicating Information; Defining problems; and Developing and Using Models
- CCC: Structure and Function

Unit six builds upon previous knowledge students gained in the final unit of the first year in the Engineering and Manufacturing Technology Pathway. Student will learn to plan and code more sophisticated machine control routines.
At the completion of Unit 6, Students will be able to:

1. Create detailed flow charts and write pseudocode for planning purposes
2. Create system control programs that utilize flowchart logic with comments
3. Choose appropriate inputs and output devices based on the needs of a given design.
4. Design and create a control system based on give criteria and constraints.
5. Upload debugged code to a microprocessor for execution.

Unit Assignment:
At the conclusion of unit six, student will have completed a microprocessor controlled test bed, integrating motor and servos with various sensors, that will be able to accomplish an instructor defined challenge, such as the well-known "marble sorter" project (from the Project Lead the Way™ *Principles of Engineering* course).

Unit 7: **Final Project** *(8 weeks)*

The final project in the second year of the pathway requires students to work together in small groups to apply everything they have learned to date toward developing a solution for a "problem scenario" that will be assigned to them by the course instructor. The project criteria will be very similar in nature to those found at FIRST Robotics competitions. These competitions typically involve semiautonomous vehicles with electromechanical capabilities designed to solve a designated set of problems.

End of Course Assessment:
The Principles of Engineering and Manufacturing (H) end of course assessment will be a comprehensive examination. The assessment covers learning objectives from each unit from both semesters.

Glendale Unified School District School

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Career Technical Education
Course Title:	Introduction to Engineering Design Technology 1-2
Course Code:	(*Educational Services will assign course number **after** Board Approval)*
Grade Level(s):	9-10
School(s) Course Offered:	Crescenta Valley High School
UC/CSU Approved (Y/N, Subject):	Pending, "g" College Prep Elective credits
Course Credits:	10
Recommended Prerequisite:	Grade level math and science
Recommended Textbook(s):	Parametric Modeling with Autodesk Fusion 360, SDC Publications, ISBN-13: 978-1630571993, ISBN-10: 1630571997 Principles of Applied Engineering, Pearson, ISBN-13: 978-0-13-470189-9 ISBN-10: 0-13-470189-5
Course Overview:	This is the first in a series of three courses in the Engineering and Manufacturing Technology (E&MT) Pathway. It is an exploratory course intended to introduce students to the engineering profession, in general, with a specific emphasis on electromechanical product design. The first semester of the Introduction to Engineering Design Technology (IEDT) course begins with developing the students' skills in design thinking, sketching techniques, measurement, and statistical analysis. Students will also learn the basics of solid modeling and technical drawing production. The course continues in the second semester with an introduction to mechanical systems, electrical circuits, and concludes with machine control programming skills. By the conclusion of the first year, students will be able to conceive, describe, document, and then construct simple computer controlled electromechanical devices, such as an automated guided vehicle (AGV).

First Semester-Course Content

Unit 1: **Introduction to The Design Process** (*4 weeks)*

STANDARDS
CTE Pathway (Engineering Technology) Standards:
B6.0 Employ the design process to solve analysis and design problems.

- B6.1 Understand the steps in the design process.
- B6.2 Determine what information and principles are relevant to a problem and its analysis.
- B6.3 Choose between alternate solutions in solving a problem and be able to justify the choices made in determining a solution.
- B6.4 Translate word problems into mathematical statements when appropriate.
- B6.5 Demonstrate the process of developing multiple details, within design constraints, into a single solution.
- B6.6 Construct a prototype from plans and test it.
- B6.7 Evaluate and redesign a prototype on the basis of collected test data.

Common Core ELA: AS.W.2, AS.W.8, AS.SL.4, AS.L.6, 9-10.W.2.d, 9-10.RST.4, 9-10.RST.8
Next Generation Science Standards:
HS.ETS.1.4

- DCI: ETS1.B
- SEP: Obtaining, Evaluating, and Communicating Information; Defining
- problems; and Developing and Using Models

Unit one introduces students to the design process that engineers use to develop innovative solutions to real problems. At the completion of Unit 1, Students will be able to:

1. Identify the steps in an engineering design process and describe the activities involved in each step of the process.
2. Identify and describe a variety of brainstorming techniques and rules for brainstorming.
3. Generate and document multiple ideas or solution paths to a problem through brainstorming.
4. Describe the design process used in the solution of a particular problem and reflect on all steps of the design process.

Unit Assignment: At the conclusion of unit one, student will be to engage in product design thinking. The key student project includes the design and production of a real world product, such a game that includes a set of rules, games pieces and a playing board. Project assessment includes adherence to rubric of criteria and successful presentation via "product testing" by classmates.

Unit 2: **Developing Sketching Skills** (*5 weeks)*

STANDARDS
CTE Pathway (Engineering Technology) Standards:
B2.0 Demonstrate the sketching process used in concept development.

- B2.1 Understand the process of producing proportional two- and three-dimensional sketches and designs.
- B2.2 Apply sketching techniques to a variety of architectural and engineering models.
- B2.3 Present conceptual ideas, analysis, and design concepts using freehand graphic communication techniques.

Common Core Math: G.MG.1, N.Q.1 , N.Q.2, , N.Q.3
NGSS HS: HS.ETS.1.4

- DCI: ETS1.B
- SEP: Obtaining, Evaluating, and Communicating Information; Defining problems; and Developing and Using Models
- CCC: N/A

Unit two develops student understanding of the purpose and practice of visual representation and communication within the engineering profession via technical sketching and drawing. Students build skill and gain experience in representing three-dimensional objects in two dimensions. Students will create various technical representations used in visualization, exploring, communicating, and documenting design ideas throughout the design process, and they will understand the appropriate use of specific drawing views (including isometric, oblique, perspective, and orthographic projections). They progress from creating free hand technical sketches using a pencil and paper to developing engineering drawings according to accepted standards and practices that allow for universal interpretation of their design.

At the completion of Unit 2, Students will be able to:

1. Identify and define technical drawing representations including isometric, orthographic projection, oblique, and perspective views.
2. Identify the proper use of each technical drawing representation including isometric, orthographic projection, oblique, and perspective views.
3. Apply tonal shading to enhance the appearance of a pictorial sketch and create a more realistic appearance of a sketched object.
4. Hand sketch isometric views of a simple object or part at a given scale using the actual object, a detailed verbal description of the object, a pictorial view of the object, or a set of orthographic projections.
5. Hand sketch 1-point and 2-point perspective pictorial views of a simple object or part given the object, a detailed verbal description of the object, a pictorial view of the object, and/or a set of orthographic projections.

6. Hand sketch orthographic projections at a given scale and in the correct orientation to fully detail an object or part using the actual object, a detailed verbal description of the object, or a pictorial and isometric view of the object.
7. Determine the minimum number and types of views necessary to fully detail a part.

Unit Assignment: At the conclusion of unit two, students will be able to fully describe a product that would be manufactured. The key student project includes the design of an interlocking puzzle cube with a variety geometrically unique pieces. Students will be assessed through their submission of a series of "engineering notebook" entries that must conform to industry standards for such documents.

Unit 3: **Engineering Units, Measurements and Statistics** (*5 weeks)*

STANDARDS
CTE Pathway (Engineering Technology) Standards:
B7.0 Understand industrial engineering processes, including the use of tools and equipment, methods of measurement, and quality assurance.

- B7.1 Know the structure and processes of a quality assurance cycle.
- B7.4 Estimate and measure the size of objects in both Standard International and United States units.

Common Core Math: G.MG.1, N.Q.1, N.Q.2, N.Q.3, S.ID.1, S.ID.4, S.ID.6, S.ID.6c, S.ID.7, S.ID.8

- **NGSS HS:** HS.ETS.1.4
- **DCI:** ETS1.B

Unit three familiarizes students with appropriate practices and the applications of measurement (using both U. S. Customary and SI units) and statistics within the discipline of engineering. Students will learn appropriate methods of making and recording measurements, including the use of dial calipers, as they come to understand the ideas of precision and accuracy of measurement and their implications on engineering design. The concepts of descriptive and inferential statistics are introduced as methods to mathematically represent information and data and are applied in the design process to improve product design, assess design solutions, and justify design decisions. Students are also provided with practice in unit conversion and the use of measurement units as an aid in solving practical problems involving quantities. A spreadsheet program is used to store, manipulate, represent, and analyze data, thereby enhancing and extending student application of these statistical concepts. At the completion of Unit 3, Students will be able to:

1. Distinguish between precision and accuracy of measurement.
2. Measure linear distances (including length, inside diameter, and hole depth) with accuracy using a scale, ruler, or dial caliper and report the measurement using an appropriate level of precision.

3. Convert quantities between units in the SI and the US Customary measurement systems.
4. Calculate statistics related to central tendency including mean, median, and mode.
5. Calculate statistics related to variation of data including (sample and population) standard deviation and range.
6. Use statistics to quantify information, support design decisions, and justify problem solutions.
7. Use a spreadsheet program to store and manipulate raw data, perform calculations using formulas, and create and display a histogram to represent a set of data.
8. Use function tools within a spreadsheet program to calculate statistics for a set of data including mean, median, mode, range, and standard deviation.

Unit Assignment: At the conclusion of unit three, student will produce the design from unit 2 and be able to determine the level of quality of the "manufactured" parts. The key student assignment includes the analysis of the measured quality of the parts produced. Assessment for this project involves meeting all the product criteria and requirement for the design.

Unit 4: **Introduction to Computer Modeling** (*6 weeks)*

STANDARDS
CTE Pathway (Engineering Technology) Standards:
B1.0 Communicate and interpret information clearly in industry-standard visual and written formats.

- B1.2 Describe the current industry standards for illustration and layout.
- B1.3 Draw flat layouts of a variety of objects by using [CAD] tools and techniques
- B1.4 Organize and complete an assembly drawing using information collected from detailed drawings.

Common Core ELA: G.MG.1, N.Q.1, N.Q.2, N.Q.3
Common Core Math: G.MG.1, N.Q.1, N.Q.2, N.Q.3, S.ID.1, S.ID.4, S.ID.6, S.ID.6c, S.ID.7, S.ID.8
NGSS HS:
HS.ETS.1.4

- DCI: ETS1.B
- SEP: Developing and Using Models
- CCC: Structure and Function

Unit four introduces students to solid modeling using computer aided design (CAD) software. Students will obtain a basic fluency in geometric concepts that are essential in the modern design process. Students will use these concepts, as well as physical properties

to solve a variety of problems including computation of surface area, weight, and volume in order to provide cost estimates for related materials based on physical property observations. At the completion of Unit 4, Students will be able to:

1. Identify types of polygons including a square, rectangle, pentagon, hexagon, and octagon, as well as differentiate between inscribed and circumscribed shapes.
2. Identify and differentiate geometric constructions and constraints (such as horizontal lines, vertical lines, parallel lines, perpendicular lines, colinear points, tangent lines, tangent circles, and concentric circles) and the results when applied to sketch features within a 3D solid modeling environment.
3. Define the term "physical property" and identify the properties of length, volume, mass, weight, density, and surface area as physical properties and distinguish between the meanings of the terms weight and mass.
4. Solve real world and mathematical problems involving area and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, right prisms, cylinders, and spheres.
5. Create three-dimensional solid models of parts within CAD from sketches or dimensioned drawings using appropriate geometric and dimensional constraints and model features and generate basic engineering drawings based on their solid models

Unit Assignment: At the conclusion of unit four, students will have created a solid model of a real-world product that has multiple and varied interchangeable parts. The key student project includes the production of a full set of engineering drawings that represents this product.

Second Semester-Course Content

Unit 5: **Introduction to Mechanical Systems** (*6 weeks)*

STANDARDS
CTE Pathway (Engineering Technology) Standards:
B5.0 Understand how the principles of force, work, rate, power, energy, and resistance relate to mechanical, electrical, fluid, and thermal engineering systems.

- B5.3 Compare and explore the six simple machines and their applications.
- B5.5 Formulate and solve problems by using the appropriate units applied in mechanical, electrical, fluid, and thermal engineering systems.

NGSS HS:
HS.ETS.1.4

- DCI:
- SEP:
- CCC:

Unit five introduces students to the simple machines (levers, pulleys, etc.) and the principle of mechanical advantage. Students will go on to analyze the function of more complex machines through their understanding of the basic mechanisms. At the completion of Unit 5, Students will be able to:

1. Determine the mechanical advantage of mechanisms that employ the six simple machines (levers, incline planes, wheel and axles, screws, pulleys and wedges).
2. Compute drive ratios in mechanisms that use gear trains, pulley drives and sprocket systems to determine speed and torque.
3. Design, create and test demonstration gear trains, pulley drives and sprocket systems.
4. Compute efficiency determine the trade-off involved in mechanical systems.
5. Design, create and test a demonstration complex machine.

Unit Assignment:
At the conclusion of unit five, students will demonstrate their understanding of how mechanisms can be made more efficient through manipulating the trade-offs between force and distance in the design of mechanical systems. The key student project includes the creation of a "Rube Goldberg machine" that accomplished an everyday task. Assessment will involve evaluating the students' analysis of their project's mechanical principles.

Unit 6: **Introduction to Electric Circuits** (*4 weeks)*

STANDARDS
CTE Pathway (Engineering Technology) Standards:
B3.0 Identify the fundamentals of the theory, measurement, control, and applications of electrical energy, including alternating and direct currents.

- B3.2 Analyze relationships between voltage, current, resistance, and power related to direct current (DC) circuits.
- B3.3 Calculate, construct, measure, and interpret both AC and DC circuits.
- B3.5 Calculate loads, currents, and circuit-operating parameters.
- B3.6 Classify and use various electrical components, symbols, abbreviations, media, and standards of electrical drawings.
- B3.7 Analyze, repair, or measure electrical and electronic systems, circuits, or components using appropriate electronic instruments.
- B3.8 Predict the effects of circuit conditions on the basis of measurements and calculations of voltage, current, resistance, and power.

NGSS HS:
HS.ETS.1.4

- **DCI:**
- **SEP:**
- **CCC:**

Unit six introduces students to basic electrical theory and circuits. Students will use Ohm's Law and Kirchhoff's Law to solve for unknown quantities in series, parallel, and series-parallel low-voltage DC circuits. At the completion of Unit 5, Students will be able to:

1. Use Ohm's Law to solve electrical equations involving voltage, current, and resistance.
2. Verify previous calculations by building the electric circuits with electronic components on a breadboard before using a digital multi-meter to measure actual voltage and current.
3. Demonstrate understanding of electronic symbols by interpreting existing and creating new electronic schematics.
4. Add electrical power to mechanical devices using DC motors.

Unit Assignment:
At the conclusion of unit six, students will be assessed by formal examination.

Unit 7: **Introduction to Machine Control** (*10 weeks)*

STANDARDS
CTE Pathway (Engineering Technology) Standards:
B8.0 Understand fundamental control system design and develop systems that complete preprogrammed tasks.

- B8.1 Identify the elements and processes necessary to develop a controlled system that performs a task.
- B8.2 Demonstrate the use of sensors for data collection and process correction in controlled systems.
- B8.3 Perform tests, collect data, analyze relationships, and display data in a simulated or modeled system using appropriate tools and technology.
- B8.4 Program a computing device to control systems or process.
- B8.5 Use motors, solenoids, and similar devices as output mechanisms in controlled systems.
- B8.6 Assemble input, processing, and output devices to create controlled systems capable of accurately completing a preprogrammed task.

B10.0 Design and construct a culminating project effectively using engineering technology.

- B10.1 Use methods and techniques for employing all engineering technology equipment appropriately.
- B10.2 Apply conventional engineering technology processes and procedures accurately, appropriately, and safely.
- B10.3 Apply the concepts of engineering technology to the tools, equipment, projects, and procedures of the Engineering Technology Pathway.

Common Core ELA: AS.W.2, AS.W.8, AS.SL.4, AS.L.6, 9-10.W.2.d, 9-10.RST.4, 9-10.RST.8
Common Core Math: G.MG.1, N.Q.1, N.Q.2, N.Q.3, S.ID.1, S.ID.4, S.ID.6, S.ID.6c, S.ID.7, S.ID.8
NGSS HS: HS.ETS.1.4

Unit seven introduces students to the basics of machine control through the programming of microcontrollers and the integration of sensors and actuators into mechanical systems. Students will begin with creating a program flow before deciding how sensors can provide inputs and how actuators (like motors) can receive outputs.

At the completion of Unit seven, Students will be able to:

1. Design a theoretical automated mechanical system by defining all inputs, outputs and decisions using a flow chart, and then convert the flow chart into pseudo code instructions.
2. Use variables and functions to write simple programs in the C computer language to be uploaded to a microprocessor.
3. Integrate various sensors, motors and servos into a mechanical system that is controlled by a microprocessor.
4. Design and build a demonstration autonomous vehicle.

The final project for students in this course will require them to use all the skills from this and the earlier units in this course. Student will be given a problem that will require them to use the design process to develop a concept for an automated guided vehicle (AGV). Students will create sketches, solid models, write the code, and then plan the construction of this AGV. Student will be evaluated against a set of performance criteria for their project. The criteria will consist of functions for the AGV to complete, such as autonomous navigation through an obstacle course, or following a pre-defined path, etc.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval.)*

Department:	Career Technical Education / Visual and Performing Arts
Course Title:	Honors Photography 3-4
Course Code:	(Educational Services will assign course number ***after*** Board Approval)
Grade Level(s):	10 - 12
School(s) Course Offered:	Hoover High School
UC/CSU Approved (Y/N, Subject):	Yes, "f" Fine Art credits
Course Credits:	10
Recommended Prerequisite:	B or better in Photography 1-2 This course is a recommended prerequisite for AP Studio Arts; Art Seminar
Recommended Textbook:	Focus on Photography, ISBN 10: 0-87192-721-7 The Visual Experience, ISBN: 978-08719-2627-2
Course Overview:	This course is designed for advanced photography students who wish to push their creative potential by exploring and experimenting with the ideas and practices of 21st century art. Students will focus on the connections between conceptual and technical aspects of their photographic practice and develop personal themes. Emphasis is placed on understanding of concept and technique, critique processes, evaluation utilizing the Elements and Principle of Art Making, research of

art historical figures, and professional practice. Students are required to maintain a sketchbook, which will include weekly drawing assignments and preliminary studies of projects. In addition to creating portfolio artworks, all assignments throughout the course will require students to analyze, critique, and discuss the meaning and purpose of various artworks and how the artists employ the elements of art and principles of design to communicate meaning. The course will culminate with the completion of a digital and physical portfolio of artwork, artist statement, and resume.

First Semester-Course Content

Unit 1: **Tell Me A Story** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.6; 2.1; 2.2; 2.4; 4.1; 4.2
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.6 & A2.3

A. Photography is a visual language that is applicable to all visual art areas. In this unit students will use photography to create a personal narrative. Students will use language and the prior knowledge learned in Photo 1-2, including the elements of art/principles of design. Students will use vocabulary associated with the use of value, line, texture, shape, balance, movement, repetition, contrast, etc. to create a photo essay. Students will learn how editing and sequencing images creates meaning.

B. Students will create a photo narrative in 5-7 images. Students will be required to use photography as a tool to convey larger concepts and production ideas in the form of visual storytelling. Students will write an artist statement and present their work for critique. A rubric will be used for assessing craftsmanship and conceptual clarity, while verbal critique will offer collaborative analysis and discussion.

Unit 2: **Investigation** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.6; 2.1; 2.2; 2.4; 4.1; 4.2
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.7; A2.3; A2.4; A3.4; A5.6; A8.4

A. Research is the foundation for creating meaningful photographic projects. Students will learn a variety of research techniques and apply them to their project. Students

will examine the historic and current cultural aspects of their chosen theme and apply what they have learned to a series of photographs (7-10 images).

B. Students will choose a personal theme to research and create a body of work based on the concepts and techniques learned during the process of independent research. Students will analyze and prioritize their images by focusing on technical and aesthetic qualities and use Photoshop to edit their images. Students will write an artist statement and present their work for critique. A rubric will be used for assessing craftsmanship and conceptual clarity, while verbal critique will offer collaborative analysis and discussion.

Unit 3: **Connection** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts. Standards 2.1, 2.3, 3.3, 5.1 & 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A2.6, A2.7, & A2.9

A. This unit establishes the framework needed for students to compose and communicate conceptual ideas using photographic imagery. Compositional rules and visual vocabulary will allow students to determine artistic intent and facilitate the development of individual artistic style and voice. Students will be able to identify and design content for specific audiences while considering how historical and cultural elements affect message and meaning.

B. Students will develop a thematic body of work that connects their work to contemporary cultural issues. Students will write an artist statement on the connections between the conceptual and technical aspects of their artwork and the historic and current cultural understanding of their chosen theme. Students will analyze and prioritize their images by focusing on technical and aesthetic qualities and use Photoshop to edit their images. A rubric will be used for assessing craftsmanship and conceptual clarity, while verbal critique will offer collaborative analysis and discussion.

Unit 4: **Website Portfolio** *(2-3 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.3; 2.2; 2.3; 3.1; 3.3; 3.4; 4.2; 4.5; 5.1; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.7; A2.3; A2.4; A2.6; A3.4; A5.6; A8.4

A. Students will receive an overview of the different programs available for creating an online portfolio (Google Slides, Weebly, WordPress for tech savvy students, etc.) Lecture presentation and student research will investigate the many types of offerings and organization techniques employed in artists websites. Discussions will center around analysis of user-friendly effectiveness, consistency, flow, clarity of artists voice. Students will choose several models as guidelines and select a program to create an online portfolio. Students will also learn about display, photography and documentation of art work.

B. Students will gather all art work from present, and past art classes, or self-generated works. With individual and peer assessment, students will choose a minimum of 10 works of art to begin an online portfolio. All work will be professionally photographed and manipulated to upload onto the chosen format. Students will organize the images into a unifying flow, and draft and upload a personal artist's statement to complete the narrative. Project based assignments will allow students to design concepts around summative assessments and written/verbal critique will allow students to analyze and improve their work.

Second Semester-Course Content

Unit 5: **Identity** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.4; 2.1; 2.3; 2.5; 3.3; 4.1; 4.2; 4.5; 5.1
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.7; A2.3; A2.4; A2.6; A3.4; A5.6; A8.4

A. Students will study historic and contemporary photographic self-portraits that challenge our concept of traditional portraiture. Through visual motivation and lecture, students will analyze how artists have effectively applied the elements and principals of design to examine the idea of personal identity.

B. Using student driven choice of materials, students will create a photographic artwork that examines their identity. Students will write an artist statement on the connections between the conceptual and technical aspects of their artwork and the historic and current cultural understanding of portraiture. Students will analyze and prioritize their images by focusing on technical and aesthetic qualities and use Photoshop to edit their images. A rubric will be used for assessing craftsmanship and conceptual clarity, while verbal critique will offer collaborative analysis and discussion

Unit 6: **Personal Theme** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.4 & 5.1
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.9 & A2.2

A. In this unit students will focus on their personal artistic practice and identify a personal theme that runs throughout their work and practice. Students will use brainstorming exercises and research to further examine their theme and create photographic images that create a completed thematic portfolio of 15 images.

B. Students will complete a process of brainstorming that will lead them to their personal theme. Students will gather all prior work that focuses on their personal theme and create new work to "complete" the body of work. Students will write an artist statement explaining their personal theme, including conceptual and technical aspects as well as cultural and personal connections. A rubric will be used for assessing craftsmanship and conceptual clarity, while verbal critique will offer collaborative analysis and discussion.

Unit 7: **Alternative Processes** *(2-3 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.6, 2.1 & 4.2
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.7, A2.5, A4.6 & A8.2, A8.4

A. Students will be introduced to a variety of alternative processes, both digital and analog, that they can choose to investigate for this unit. Students will work independently to master the process they have selected. Students will use research skills to write an artist statement about their work that includes a history of the process and its cultural connections.

B. Students will be introduced to the history of alternative processes and their technical aspects. Students will research the process of their choice and create a work of art using that process in a contemporary way. Students will present their work to the class and give a short demonstration on the process. A rubric will be used for assessing craftsmanship and conceptual clarity.

Unit 8: **Portfolio Presentation** *(4-5 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.3; 2.2; 2.3; 3.1; 3.3; 3.4; 4.2; 4.5; 5.1; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.7; A2.3; A2.4; A2.6; A3.4; A5.6; A8.4

A. Students will discuss the advantages and limitations of digital and physical portfolios. Discussion will focus on the photographer's presence as a professional. Students will receive a review of the different programs available for creating an online portfolio. Students will update their websites created at the close of semester one and create a physical portfolio of 15-20 photographic images.

B. Students will edit 15-20 photographic images to represent themselves as a photographer. Students will organize the images into a unifying flow, and draft and an updated personal artist's statement and resume to complete the narrative. Project based assignments will allow students to design concepts around summative assessments and written/verbal critique will allow students to analyze and improve their work.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval.)*

Department:	Career Technical Education / Visual and Performing Arts
Course Title:	Photography Foundations 1-2
Course Code:	(Educational Services will assign course number after Board Approval)
Grade Level(s):	9-12
School(s) Course Offered:	Hoover High School
UC/CSU Approved (Y/N, Subject):	Pending, "f" Fine Arts credit
Course Credits:	10
Recommended Prerequisite:	This course is a recommended prerequisite for Photography 3-4 and AP Photography
Recommended Textbook:	Focus on Photography, ISBN 10: 0-87192-721-7 The Visual Experience, ISBN: 978-08719-2627-2

Course Overview: This course will introduce the student to Photography as an artistic medium for personal expression as well as a commercial medium. The basic use of cameras (35 mm and digital), film, darkroom development and digital imaging will be taught. Composition, communication, and critical thinking will be combined with continual self and class evaluation. Students will be exposed to historical and cultural uses of photography with the goal of incorporating these concepts into their own work. Students will explore careers in photography performing these roles. Students will complete this course with the key technological skills appropriate for occupations in the arts industry. Students will prepare a

portfolio of their original works for college application, job application and/or personal collection. Photo 1-2 fulfills the F requirement, Career Prep graduation requirement, and Elective/G requirements (consecutively).

First Semester-Course Content

Unit 1: **Elements/Principles of Art and Design** *(4 weeks)*

STANDARDS
National Arts
Standards 1.1; 1.2; 1.4 & 2.1
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.2; A1.3; A1.6 & A2.3

A. Photography is a visual language that is applicable to all visual art areas. In this unit students will use photography to explore the elements of art/principles of design. Students will use vocabulary associated with the use of value, line, texture, shape, balance, movement, repetition, contrast, etc. Students will learn how the manipulation of these elements/principles in art can create meaning and support expression. This unit focuses on establishing visual proficiency for illustrating concepts that are applicable to a variety of art and design fields.

B. Students will create photographs of a variety of subjects that demonstrate a basic understanding of the elements of art/principles of design. Students will be introduced to Photoshop as an editing software and a basic workflow. Students will also be required to use photography as a tool to convey larger concepts and production ideas in the form visual storytelling. Students will describe, analyze and critique an historical photograph. A rubric will be used for assessing craftsmanship and conceptual clarity, while verbal critique will offer collaborative analysis and discussion.

Unit 2: **Light & Motion** *(4 weeks)*

STANDARDS
Visual and Performing Arts
Standards 1.1; 1.2; 1.4 & 1.6
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.2; A1.3; A1.6 & A4.3

A. Shutter Speed and Aperture are the foundations for creating photographs. In this unit students will learn the functions of camera technology and how light is used to create and manipulate photographic imagery.

B. Students will be introduced to the functions of SLR and DSLR cameras and create photographs that show motion using a variety of shutter speeds and the proper coordinating aperture. Students will analyze and prioritize their images by focusing on technical and aesthetic qualities and use Photoshop to edit their images. Students will describe, analyze and critique photographs of motion throughout history and technological developments in photography equipment. A rubric will be used for assessing craftsmanship and conceptual clarity, while verbal critique will offer collaborative analysis and discussion.

Unit 3: **Aperture and Point of View** *(4 weeks)*

STANDARDS
Visual and Performing Arts
Standards 2.1, 2.3, 3.3, 5.1 & 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A2.6, A2.7, & A2.9

A. This unit establishes the framework needed for students to compose and communicate conceptual ideas using photographic imagery. Compositional rules and visual vocabulary will allow students to determine artistic intent and facilitate the development of individual artistic style and voice. Students will be able to identify and design content for specific audiences while considering how historical and cultural elements affect message and meaning.

B. Students will develop a body of work that expresses the concept of the symbolic self-portrait, incorporates the rule of thirds and uses aperture to distinguish focal point. Students will analyze and prioritize their images by focusing on technical and aesthetic qualities and use Photoshop to edit their images. Students will describe, analyze and critique conceptual portraiture. Students will interpret the symbolic self-portraits made by their peers and critique their use of visual language. Students will learn to utilize a variety of communication methods and persuasive techniques while utilizing critique methods to reflect upon their processes.

Unit 4: **Color** *(4 weeks)*

STANDARDS
Visual and Performing Arts
Standards 2.4 & 4.5
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.2, A2.3 & A4.4

A. This unit focuses on the use of color in digital and traditional photography. Using their knowledge of basic elements of art, students will delve deeper into color theory and the ways in which light and color can be manipulated to achieve artistic effects and enhance meaning.

B. Students will analyze how color can affect the aesthetic value of an image and develop a body of work that uses color as visual language. Students will analyze and prioritize their images by focusing on technical and aesthetic qualities and use Photoshop to edit their images that best communicate their interpretation of the project. Students will use academic vocabulary to describe, analyze, and critique the photographs made by their peers, focusing on their use of color and visual language.

Unit 5: **Advertising** *(4 weeks)*

STANDARDS
Visual and Performing Arts
Standards 1.4, 2.1 & 2.5
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.3, A2.9 & A2.9

A. This unit focuses on building visual literacy. It includes close and thoughtful "readings" of works from a variety of media so students can expand their observation and reflective thinking skills, form connections to many aspects of human experience, and foster an expanded concept of literacy. This process encourages students to carefully consider and articulate the choices they make in their own development as artists and thinkers.

B. Students will create print advertisements for a chosen product, business, or service, using persuasive techniques and visual language designed to appeal to specific target audiences. In critique, students will pitch their idea to the product company and articulate how the target audience will be affected by the persuasive technique. A rubric will be used for assessing proficiency and students will participate in verbal critique with peer input.

Second Semester-Course Content

Unit 6: **Portraiture** *(5 weeks)*

STANDARDS
Visual and Performing Arts
Standards 1.1; 1.2; 1.4 & 5.1
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.2; A1.3; A1.9 & A2.2

A. This unit focuses on how to operate as a freelance portrait photographer. Students will learn about business and copyright law in relation to photography. Students will also learn about the different styles of portraiture, the history of portraiture, and lighting techniques specific to portraiture.

B. Students will go through the process of creating a freelance business and branding their business by creating business cards, letterhead, and a website. Students will have a friend or family member "hire" them for studio and environmental portraits that they will edit and create prints. Students will describe, analyze and critique historical and contemporary portraiture. A rubric will be used for assessing proficiency and students will participate in verbal critique with peer input.

Unit 7: **Photojournalism** *(4 weeks)*

STANDARDS
Visual and Performing Arts
Standards 1.1; 1.2 & 5.1
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A21., A2.3, A3.3, & A5.7

A. Building on prior knowledge regarding documentary photography, students will learn about the role of the photojournalist in our society. Students will learn the language of journalism and approaches to creating photo essays. Students will analyze and critique the various ways they have used photographs, text, and design elements to convey their story.

B. Students will analyze current newspaper article layouts, use of photography, angle, and level of information. Acting as journalist and photojournalist, students focus on an event, location, or person, and create a newspaper article that communicates a story using photographs and text. In mid-critique and final critique students will act as editor and proof their fellow student's articles in preparation for press, giving

feedback on strengths and weaknesses using the unit vocabulary. A rubric will be used for assessing proficiency and students will participate in verbal critique with peer input.

Unit 8: **Appropriation/Montage** *(3 weeks)*

STANDARDS
Visual and Performing Arts
Standards 1.6, 2.1 & 4.2
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.7, A2.5, A4.6 & A8.4

A. Students will learn about various techniques for conceptualizing and creating singular images out of multiple sources. Students will learn about the history of photo manipulation, montage, and appropriation. Students will learn about current laws regarding Usage and the Artist's Right to Collage.

B. Students will sketch their design ideas and previsualize their projects. Students will use Photoshop to create photomontages using appropriated and original imagery to create a surrealistic narrative. A rubric will be used for assessing proficiency and students will participate in verbal critique with peer input.

Unit 9: **Black & White Analog Photography** *(6 weeks)*

STANDARDS
Visual and Performing Arts
Standards 1.6, 2.1 & 4.2
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.7, A2.5, A4.6 & A8.2, A8.4

A. This unit introduces students to film and darkroom technology. Students will learn the history of the photogram and film photography. Students will learn how to use manual SLR cameras, how to develop film, and how to print in the darkroom.

B. Students will create photograms using objects that range in dimensionality and translucency. Students will use black and white film to create a personal project focused on an aspect of the theme: Black and White. A rubric will be used for assessing proficiency and students will participate in verbal critique with peer input.

Unit 10: **Conceptual Art** *(4 weeks)*

STANDARDS
Visual and Performing Arts
Standards 1.1; 1.2; 1.4, 5.4 & 5.1
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.2; A1. A2.6, A2.8, A2.9, A4.6 & A5.2

A. This unit focuses on artmaking where the concept or idea involved in the work take precedence over traditional aesthetic and material concerns. Students will learn about the history of Conceptual Art and look at the work of contemporary conceptual photographers.

B. Students will complete a process of brainstorming that will lead them to an essential question. Students will create a conceptual project based on their essential question. Students will present their project to the class and answer questions from their peers and teacher. A rubric will be used for assessing proficiency.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval.)*

Department:	Career Technical Education / Visual and Performing Arts
Course Title:	Photography Seminar Honors
Course Code:	(Educational Services will assign course number *after* Board Approval)
Grade Level(s):	11-12
School(s) Course Offered:	Hoover High School
UC/CSU Approved (Y/N, Subject):	Yes, "f" Fine Art credits
Course Credits:	10
Recommended Prerequisite:	Photo 1-2 and AP Studio Art or Honors Photography 3-4
Recommended Textbook:	Focus on Photography, ISBN 10: 0-87192-721-7 The Visual Experience, ISBN: 978-08719-2627-2
Course Overview:	Studio Art Seminar Honors is a coursed designed to provide students in the Studio Art pathway a fourth year course to work on specific projects and work-based learning opportunities in career training. This course is designed to allow fourth-year studio art students the chance to build their portfolio for college applications, internships, and professional presentation. Assignments will focus on visual problem solving, creative thinking and self-expression. Students will continue development of portfolio by pursuing an area of focus (subject, topic/theme or genre), and continued development of their artistic voice and style in a variety of selected media. This area of focus will be a yearlong, in-depth study. By the end of this course it is expected that students will have a cultivated

portfolio that showcases the breadth of their artistic skills and interests, as well as their ability to sustain a more in-depth creative exploration. Students are required to maintain a sketchbook, which will include weekly drawing assignments and preliminary studies of projects. In addition to creating portfolio artworks, all assignments throughout the course will require students to analyze, critique, and discuss the meaning and purpose of various artworks and how the artists employ the elements of art and principles of design to communicate meaning and feeling. This class is project based and hands on. Emphasis is placed on understanding of critique processes, evaluation utilizing the Elements and Principle of Art Making, research of art historical figures, and professionalism of finish product. The class will culminate with a gallery exhibition developed, organized, and executed by the students.

First Semester-Course Content

Unit 1: **Portfolio Review/ Proposal Development** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 2.1; 2.2; 2.4; 2.5; 2.6; 3.3; 3.4; 4.1; 4.2; 4.3; 4.4; 4.5; 5.2; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.1; A1.2; A1.3; A1.7; A1.9; A2.2; A2.3; A2.4; A2.6; A2.7; A2.8; A3.1; A3.4; A4.6; A5.2; A5.3; A5.6; A7.1; A7.5 A8.1

A. Students will meet with teacher for individual review of portfolio, and discuss student interests and areas for further development and study. This discussion will be an opportunity to inform and direct an emphasis for their year-long project (this may be specific subject matter, topic/theme, genre or formal problem that they wish to explore further). After stating the focus and their intent/desired outcomes for this project, students will select media and techniques they will need to learn/improve.

B. Once their project proposal is drafted, students will create an image board and have a formal conference with their teacher for feedback and approval. Once approved, students will create a project calendar of projected dates for completion of the various stages of each artwork: conception/planning/sketching, execution, critique and revision, completed works. Students will also execute the first of the series of art works which will serve as a "thesis statement", and a spring board point for remaining portfolio works. Students will present their proposal, and initial art work in small groups for critique, the group will offer collaborative analysis and discussion.

Unit 2: **Executing the Series (First Semester Works)** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 2.1; 2.2; 2.3; 2.4; 2.5; 2.6; 3.3; 3.4; 4.1; 4.2; 4.3; 4.4; 4.5; 5.2; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.1; A1.2; A1.3; A1.5; A1.7; A1.8; A2.2; A2.3; A2.4; A2.6; A2.7; A2.8; A2.9; A3.2; A3.4; A4.3; A4.6; A5.2; A5.3; A5.4; A5.6; A7.1; A8.4

A. The unit provides students with the necessary framework to guide the execution of their subsequent 3-5 artworks. They will meet with their teacher to first review potential techniques that they must practice/master in order to execute the desired style of artwork. After, executing various practice assignments in their sketchbooks each student will then refer to their image board for additional resources to determine the content of their 1st semesters' series of artworks. In these works, students will further examine how the application of elements and principles of design supports individual voice and the clarifies the communication of the intended story/meaning.

B. Once the proposals have been finalized and approved students may begin the execution of the artworks, applying and expanding upon the concepts developed in their first thesis work. Throughout this each stage of this process students will meet regularly with the teacher for progress critiques. Bi-weekly small group critiques will also be held in order to receive peer feedback. The process will be repeated for artworks 2, 3, 4, etc... As the series develops it is expected that many students will expand or alter the course of their work, thus building acuity, and intentions for this series. Students will participate in a written self-evaluation, classroom critique, and rubric-based assessments to reflect upon their designs.

Unit 3: **Expanding Ideas/ Mentors and Masters** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 2.1; 2.2; 2.3; 2.4; 2.5; 2.6; 3.3; 3.4; 4.1; 4.2; 4.3; 4.4; 4.5; 5.2; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.1; A1.2; A1.3; A1.5; A1.7; A1.9; A2.2; A2.3; A2.4; A2.6; A3.1; A3.2; A3.4; A3.6; A4.4; A5.3; A5.6; A5.7; A7.1; A8.1; A8.4; A8.5

A. This unit establishes the framework needed for students to further develop an understanding of importance of masters and mentors, and the powerful influence and learning from studying other creatives. Students will research and explore 3

artists as mentors, and discuss and analyze works of art by these chosen masters to develop a greater understanding of how these artists manipulate the elements and principles of design to communicate a powerful art aesthetic. Lecture will provide a foundation for a long and rich history of artists looking to masters and mentors for guidance and motivation. Students will research a brief history of their subject's lives, focusing on key pieces of information which helped to form the artists creative vision and direction. Students will delve into theses artists lives, what influences their artmaking, what if any lasting impact have these artists had on the world of art, and what specific aspects of these artists works are the students intending to emulate? Students will present their findings in both written and visual format.

B. Students will create a research paper and educate their audience regarding their mentor artists. Students will execute 1-2 artworks that respond to the discoveries made in study of their mentor subjects. Students will narrow and refine the pieces by concentrating on a specific concepts or processes. Influence my come from symbolism, iconography, and content, and/ or technical aspects, and/or application of the elements and principles of art. Students will create a presentation format which includes a written and visual component, as well as participate in a written self-evaluation, classroom critique, and rubric- based assessment to reflect upon their designs.

Unit 4: **Public Art and Competitions –Presentation and Professional Practice** *(2-3 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 2.1; 2.2; 2.3; 2.4; 2.5; 2.6; 3.3; 3.4; 4.1; 4.2; 4.3; 4.4; 4.5; 5.2; 5.3; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.1; A1.2; A1.3; A1.7; A1.8; A1.9; A2.2; A2.3; A2.4; 2.6; A3.1; A3.2; A3.4; A4.2; A4.3; A4.4; A5.6; A5.7; A8.4, A8.5

A. This unit provides students with the opportunity to investigate the skill set necessary for understanding the boundaries and standards required for submission in a visual arts competition. Students will survey current available open calls and competitions, local, national, or international, and make application. Competitions may require conformity to a specified theme, or may have a more open-ended constraint. Students will develop title and artist statement to elaborate on intention and creative interpretation of the theme. Students must consider how does the work relate to the premise, or answer the listed requirements? What processes will best show their personal skill level and convey their message most appropriately?

B. Students will investigate and participate in a local, national, or international competition by creating a work of art which reflects a given premise or theme. In

considering content, students will explore the relationship between their personal style, potential thematic social issues, and examine how an artist can strike a balance between satisfying personal expression whilst communicating universal message. Students will select a preferred media and create an art work for submission to the competition. Students will develop an artist's statement which explains the inspiration, and meaning of the work, and how it expresses the given theme. Students will photograph and prepare the photo and the art work for submission. Students will participate in collaborative critique and rubric assessments to reflect upon their designs.

Second Semester-Course Content

Unit 5: **Review and Focus for Semester 2 Body of Work** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 2.1; 2.2; 2.3; 2.4; 2.5; 2.6; 3.3; 3.4; 4.1; 4.2; 4.3; 4.4; 4.5; 5.2; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway
Standards A1.1; A1.2; A1.3; A1.5; A1.7; A1.8; A2.2; A2.3; A2.4; A2.6; A2.7; A2.8; A2.9; A3.2; A3.4; A4.3; A4.6; A5.2; A5.3; A5.4; A5.6; A7.1; A8.4

A. Students analyze then synthesize their work from first semester and decide on next steps for their final body of work. Discussions with the teacher review and cement findings. Afterwards the students create an outline and timeline. They make a list of materials and tools required. Class discussions commence where students share their progress and artwork with the class and receive feedback. Decisions are made as to the media and process while fine-tuning the major themes. Midway through the quarter the class will have a critique in which each student displays and presents their work, what their expectations were at the beginning of the process and how their results shifted their art practice. After this mid-point critique each student has a discussion with the teacher to outline next steps and specific goals for the rest of the year

B. In response to their previous work and shifting interests, students will choose a piece of their own artwork from 1st semester and write a visual analysis examining the conceptual, aesthetic and process-based decisions that went into the work's creation. From this analysis, students generate a new piece of artwork using a different media and/or process, while seeking to maintain the conceptual basis behind the original work. The goals of this assignment are to emphasize critical thinking and analysis of their art work, refine and expand their technical abilities,

and demonstrate their capability to communicate an idea, theme or emotion. One-on-one discussions with the teacher and group brainstorming refine each student's ideas and goals. what their expectations were at the beginning of the process and how their results shifted their art practice. Students will continue to fill out their portfolio by creating an additional 2 works which reflect this new growth and awareness. Project based assignments will allow students to design concepts around summative assessments and written/verbal critique will allow students to analyze and improve their work.

Unit 6: **Career Development** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 2.1; 2.2; 2.3; 2.4; 2.5; 2.6; 3.3; 3.4; 4.1; 4.2; 4.3; 4.4; 4.5; 5.2; 5.3; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.5; A1.7; A1.8; A1.9; A2.2; A2.3; A2.4; A2.6; A3.2; A3.5; A4.3; A4.6; A5.2; A5.3; A5.6; A5.7; A7.1; A7.2; A7.3; A7.5; A8.4; A8.6

A. Where can studying Art or Design take you? What kinds of careers exist for those who study creative subjects at high school? While becoming an architect, fine artist, sculptor or gallery assistant is an option for those who study Art or Design, there are many other careers available for those who are able to envision, design and create beautiful and/ or functional things. Art education propels people towards creative and unexpected destinations – many of which have not even been discovered yet. This unit introduces students to the vast number of related careers available in the arts. Students will hear from professionals in a variety of fields, and prepare formal professional materials necessary for entering the professional world. Summative assessments and written/verbal critique will allow students to analyze and improve their work.

B. Students will utilize "The Art Careers Project", to research careers in the creative fields. Students will begin to understand the process of branding oneself by creating a presentation which highlights their personal style, skills, and achievements. Guest speakers will provide students an avenue to delve and question professionals as to what skills they look for in potential employees. Students will create a resume, cover letter, and business, postcard with the intention of presenting this package to a professional organization i.e. a local gallery, advertising agency, interior designer, etc... A rubric will be used for assessing proficiency and students will participate in a written self-evaluation, and verbal critique with peer input.

Unit 7: **Gallery Exhibition** *(4-6 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 2.1; 2.2; 2.3; 2.4; 2.5; 2.6; 3.3; 3.4; 4.1; 4.2; 4.3; 4.4; 4.5; 5.2; 5.3; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.5; A1.7; A1.8; A1.9; A2.2; A2.3; A2.4; A2.6; A3.2; A3.5; A4.3; A4.6; A5.2; A5.3; A5.6; A5.7; A7.1; A7.2; A7.3; A7.5; A8.4; A8.6

A. The previous April, students will have visited a both a local museum and gallery exhibitions to both view art and evaluate curatorial strategies, specifically, how the artworks are displayed, their order and grouping, the lighting, the color of the walls and shape of gallery, text and titles, and analysis of the catalog or publications. Afterword a group discussion will underscore the connections and relationships to installing and curating their own exhibition. The students will use their journal and sketchbook entries, and on-site photos contributions to discussions and notes. Written/verbal critique, and public feedback will allow students to analyze and improve their work.

B. Students will select 5-8 of their strongest portfolio works and professionally mount for school gallery exhibition. The students will curate and hang a final group show which will include the organization of a formal opening. Students will be responsible for designing an online and paper invitation, evites, and other social media advertising, snacks, music, awards, and after show dismantling. Students will draft a statement of purpose about their work detailing process, siting influences, concepts, and use of materials. A rubric will be used for assessing proficiency and students will participate in a written self-evaluation, and verbal critique with peer input.

Unit 8: **Final Portfolio Presentation** *(3 weeks)*

STANDARDS
Visual and Performing Arts Standards 1.1; 1.2; 1.3; 1.4; 1.5; 1.6; 1.7; 2.1; 2.2; 2.3; 2.4; 2.5; 2.6; 3.3; 3.4; 4.1; 4.2; 4.3; 4.4; 4.5; 5.2; 5.3; 5.4
CTE Arts Media and Entertainment Arts - A. Design, Visual and Media Arts Pathway Standards A1.2; A1.3; A1.5; A1.7; A1.8; A1.9; A2.2; A2.3; A2.4; A2.6; A3.2; A3.5; A4.3; A4.6; A5.2; A5.3; A5.6; A5.7; A7.1; A7.2; A7.3; A7.5; A8.4; A8.6

A. Students will receive an overview of the different programs available for creating an online portfolio (Google Slides, Weebly, WordPress for tech savvy students, etc.…)

Lecture presentation and student research will investigate the many types of offerings and organization techniques employed in artists websites. Discussions will center around analysis of user-friendly effectiveness, consistency, flow, clarity of artists voice. Students will choose several models as guidelines and select a program to create an online portfolio. Students will also learn about display, photography and documentation of art work. Project based assignments will allow students to design concepts around summative assessments and written/verbal critique will allow students to analyze and improve their work.

B. Students will gather all art work from present, and past art classes, or self-generated works. With individual and peer assessment, students will choose a minimum of 10 works of art to begin an online portfolio. Students will organize the images into a unifying flow, and draft and upload a personal artist's statement to complete the narrative. Students will present their artist statement, and online portfolio in conjunction with 10-15 physical works. Students will invite administration, family, and other staff members to their presentation. Project based assignments will allow students to design concepts around summative assessments and written/verbal critique will allow students to analyze and improve their work.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 10

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Felix Melendez, Executive Director, Secondary Education
SUBJECT:	**Approval of New and Revised Course of Study Outlines for Use in Middle and High Schools in the Area of Mathematics**

The Interim Superintendent recommends that the Board of Education approve course of study outlines (Math 8A Summer Acceleration; Integrated Math IIIA Accelerated; Integrated Math III; Integrated Math IIIB/Precalculus Accelerated; Precalculus; Precalculus Honors) for use in middle and high schools in the area of Mathematics.

The course outlines have been reviewed for content and evaluated by the members of the Mathematics Curriculum Study Committee. The Secondary Education Council has reviewed the information and made a recommendation of approval of the course outlines to the Board of Education.

MIDDLE SCHOOLS

Department:	**Mathematics**
Course Title:	Math 8A Summer Acceleration (Summer Bridge A)
Course Code:	3140J8/3141J8
School(s) Course Offered:	Roosevelt, Rosemont, Toll, Wilson
UC/CSU Approved (Y/N, Subject):	No
Course Credits:	Full Year (10) (Summer only)

Recommended Prerequisite:	Math 7 *and* teacher recommendation
Recommended Textbook:	enVisionmath2.0: Accelerated Grade 7, Pearson
Course Overview:	This course is intended for students wishing to accelerate to Math 8B/Integrated I Accelerated in 8th grade, after completing Math 7 with an A and a teacher recommendation. This course covers half of the year-long Math 8 standards, as defined by California State Standards. Topics included are irrational numbers, exponent rules, graphing proportional relationships, solving one variable equations and inequalities, properties of transformations, properties of lines, and volume of circular solids. Placement in Math 8B/Integrated I Accelerated is dependent upon passing Math 8A Summer Acceleration with the grade of A or B. The standards covered in this course are 8th grade standards that were covered in Math 7/8A Accelerated.

HIGH SCHOOLS

Department:	**Mathematics**
Course Title:	Integrated Math IIIA – Accelerated (Summer Bridge B) ***CPM**
Course Code:	3515J/3516J
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	No
Course Credits:	10, Full Year, elective credit Summer School only
Recommended Prerequisite:	Integrated Math II, teacher approval

Recommended Textbook:	Core Connections Integrated III Judy Kysh, Evra Baldinger, Michael Kassarjian, Karen Wootton, et. al, CPM Educational Program Second Edition, Version 5.0
Course Overview:	Integrated Mathematics IIIA Accelerated is the summer bridge course for students who have completed Integrated II and would like to accelerate into Integrated IIIB/Precalculus Accelerated the following year. Integrated IIIB/Precalculus is a year and a half course. Along with this course, students will have completed all the standards in Integrated III and Precalculus in one summer and one school year. This course will strengthen and build on students' previous knowledge from Integrated Mathematics I and II standards. This course will focus on polynomial expressions and functions, quadratic functions and equations, rational functions and equations, radical functions and equations.
Department:	**Mathematics**
Course Title:	Integrated Math IIIA – Accelerated (Summer Bridge B) ***HMH**
Course Code:	3515JH/3516JH
School(s) Course Offered:	Crescenta Valley High School, Hoover High School
UC/CSU Approved (Y/N, Subject):	No
Course Credits:	10, Full Year, elective credit, Summer School only
Recommended Prerequisite:	Integrated Math II, teacher approval
Recommended Textbook:	California Integrated Mathematics 3 Timothy D. Kanold, Edward B. Burger, Juli K. Dixon, Matthew R. Larson, Steven J. Leinwand

	Houghton Mifflin Harcourt 2015
Course Overview:	Integrated Mathematics IIIA Accelerated is the summer bridge course for students who have completed Integrated II and would like to accelerate into Integrated IIIB/Precalculus Accelerated the following year. Integrated IIIB/Precalculus is a year and a half course. Along with this course, students will have completed all the standards in Integrated III and Precalculus in one summer and one school year. This course will strengthen and build on students' previous knowledge from Integrated Mathematics I and II standards. This course will focus on polynomial expressions and functions, quadratic functions and equations, rational functions and equations, radical functions and equations.
Department:	**Mathematics**
Course Title:	Integrated Math III ***CPM**
Course Code:	3513D/3514D
School(s) Course Offered:	Glendale High School, Clark Magnet High School
UC/CSU Approved (Y/N, Subject):	Y, “c” Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated Math II A/B
Recommended Textbook:	Core Connections Integrated III Judy Kysh, Evra Baldinger, Michael Kassarjian, Karen Wootton, et. al, CPM Educational Program Second Edition, Version 5.0

Course Overview:	Integrated Mathematics III aims to apply and extend what students have learned in previous courses by focusing on finding connections between multiple representations of functions, transformations of different function families, finding zeros of polynomials and connecting them to graphs and equations of polynomials, modeling periodic phenomena with trigonometry, and understanding the role of randomness and the normal distribution in making statistical conclusions. On a daily basis, students in this course use problem-solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating rigorous arguments justifying their thinking. Under teacher guidance, students learn in collaboration with others while sharing information, expertise, and ideas. The course is well balanced between procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (extension and transference). The lessons in the course meet all of the content standards, including the "plus" standards, of Appendix A of the *Common Core State Standards for Mathematics*. The course imbeds the CCSS Standards for Mathematical Practice as an integral part of the lessons in the course.
Department:	**Mathematics**
Course Title:	Integrated Math III ***HMH**
Course Code:	3513DH, 3514DH
School(s) Course Offered:	Crescenta Valley High School, Hoover High School, Verdugo Academy
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)

Recommended Prerequisite: Integrated Mathematics II

Recommended Textbook: California Integrated Mathematics 3
Timothy D. Kanold, Edward B. Burger, Juli K. Dixon, Matthew R. Larson, Steven J. Leinwand
Houghton Mifflin Harcourt, 2015

Course Overview: Integrated Mathematics III aims to apply and extend what students have learned in previous courses by focusing on finding connections between multiple representations of functions, transformations of different function families, finding zeros of polynomials and connecting them to graphs and equations of polynomials, modeling periodic phenomena with trigonometry, and understanding the role of randomness and the normal distribution in making statistical conclusions.

On a daily basis, students in this course use problem-solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating rigorous arguments justifying their thinking. Under teacher guidance, students learn in collaboration with others while sharing information, expertise, and ideas.

The course is well balanced between procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (extension and transference). The lessons in the course meet all of the content standards, including the "plus" standards, of Appendix A of the *Common Core State Standards for Mathematics*. The course imbeds the CCSS Standards for Mathematical Practice as an integral part of the lessons in the course.

Department: Mathematics

Course Title: Integrated Math IIIB/Precalculus Accelerated ***CPM/CPM**

Course Code:	3517D, 3518D
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated II/IIIA Accelerated or Integrated II + (Summer) Integrated Math IIIA Accelerated
Recommended Textbook:	Core Connections Integrated III Judy Kysh, Evra Baldinger, Michael Kassarjian, Karen Wootton, et. al, CPM Educational Program Second Edition, Version 5.0 Precalculus Josea Eggink, Samantha Falkner, Emily Kaffel, Mark Ray, Jeanne Villeneuve, Karen Wooton, Erin Yao CPM Educational Program Third Edition
Course Overview:	Integrated Mathematics IIIB/Precalculus Accelerated is part two of a two-part compacted math series. Following Integrated Mathematics II/IIIA Accelerated, this course provides students with instruction in the second half of the content of the Integrated Math III and all of the course content for Precalculus. This compression is designed as the single point of acceleration at the high school level as recommended by the California Mathematics Framework. This course is aligned to the California Common Core State standards for high school mathematics and supports the Standards for Mathematical Practice. With this course, students will develop a deep conceptual understanding of the mathematical relationships and concepts needed to succeed in higher level math courses.

In addition to covering the second half of Integrated III standards, this course meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking.

The course is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson. With the emergence of new technology, many lessons have moved beyond a traditional handheld device and are written with Desmos eTools as an integral component. The curriculum contains several key labs and hands-on activities to introduce and connect concepts, with an emphasis on modeling.

A focus on algebra is woven throughout the course. Students investigate equivalent expressions and practice setting up word problems right from the start. Students use algebra to manipulate inverse, composite, and piecewise-defined functions as well as investigate characteristics of functions and transformations of functions. Students continue rewriting expressions, solving complicated equations and systems, and use algebra to solve word problems. Algebraic manipulation is practiced throughout the rest of the course as students work with limits, rates of change, trigonometric expressions, complex numbers, series, conic sections, and area under the curve.

Careful consideration was given to the sequencing of the concepts in the course to allow for mastery over time while meeting the content standards of a 4th year course with focus on the 4th year

	math standards: algebra, functions, trigonometry, complex numbers, conic sections, probability, vectors, and matrices. In addition to the second half of Integrated III standards, this courses covers the same material as Precalculus Honors, by adding and adds rates of change, limits and area under the curve to the standard Precalculus course.
Department:	**Mathematics**
Course Title:	Integrated Math IIIB/Precalculus Accelerated ***CPM/Cengage**
School(s) Course Offered:	Clark Magnet High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated II/IIIA Accelerated or Integrated II + (Summer) Integrated Math IIIA Accelerated
Recommended Textbook:	Core Connections Integrated III Judy Kysh, Evra Baldinger, Michael Kassarjian, Karen Wootton, et. al, CPM Educational Program Second Edition, Version 5.0 Precalculus: Mathematics for Calculus James Stewart, Lothar Redlin, Saleem Watson Cengage Learning Seventh Edition
Course Overview:	Integrated Mathematics IIIB/Precalculus Accelerated is part two of a two-part compacted math series. Following Integrated Mathematics II/IIIA Accelerated, this course provides students with instruction in the second half of the content of the Integrated

Math III and all of the course content for Precalculus. This compression is designed as the single point of acceleration at the high school level as recommended by the California Mathematics Framework. This course is aligned to the California Common Core State standards for high school mathematics and supports the Standards for Mathematical Practice. With this course, students will develop a deep conceptual understanding of the mathematical relationships and concepts needed to succeed in higher level math courses.

In addition to covering the second half of Integrated III standards, this course meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking.

In addition to the second half of Integrated III standards, this courses covers the same material as Precalculus Honors, by adding and adds rates of change, limits and area under the curve to the standard Precalculus course.

Department: **Mathematics**

Course Title: Integrated Math IIIB/Precalculus Accelerated ***HMH/Cengage**

Course Code: *(Educational Services will assign course number **after** Board Approval)*

School(s) Course Offered: Hoover High School, Crescenta Valley High School, Verdugo Academy

UC/CSU Approved (Y/N, Subject):	Y, mathematics "c"
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated II/IIIA Accelerated
Recommended Textbook:	California Integrated Mathematics 3 Timothy D. Kanold, Edward B. Burger, Juli K. Dixon, Matthew R. Larson, Steven J. Leinwand Houghton Mifflin Harcourt 2015 Precalculus: Mathematics for Calculus James Stewart, Lothar Redlin, Saleem Watson Cengage Learning Seventh Edition
Course Overview:	Integrated Mathematics IIIB/Precalculus Accelerated is part two of a two-part compacted math series. Following Integrated Mathematics II/IIIA Accelerated, this course provides students with instruction in the second half of the content of the Integrated Math III and all of the course content for Precalculus. This compression is designed as the single point of acceleration at the high school level as recommended by the California Mathematics Framework. This course is aligned to the California Common Core State standards for high school mathematics and supports the Standards for Mathematical Practice. With this course, students will develop a deep conceptual understanding of the mathematical relationships and concepts needed to succeed in higher level math courses. In addition to covering the second half of Integrated III standards, this course meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to

	several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking. In addition to the second half of Integrated III standards, this courses covers the same material as Precalculus Honors, by adding and adds rates of change, limits and area under the curve to the standard Precalculus course.
Department:	**Mathematics**
Course Title:	Precalculus (*Formerly Math Analysis)* ***CPM**
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated III
Recommended Textbook:	Precalculus Josea Eggink, Samantha Falkner, Emily Kaffel, Mark Ray, Jeanne Villeneuve, Karen Wooton, Erin Yao CPM Educational Program Third Edition
Course Overview:	Precalculus meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and

rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking.

The course is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson. With the emergence of new technology, many lessons have moved beyond a traditional handheld device and are written with Desmos eTools as an integral component. The curriculum contains several key labs and hands-on activities to introduce and connect concepts, with an emphasis on modeling.

A focus on algebra is woven throughout the course. Students investigate equivalent expressions and practice setting up word problems right from the start. Students use algebra to manipulate inverse, composite, and piecewise-defined functions as well as investigate characteristics of functions and transformations of functions. Students continue rewriting expressions, solving complicated equations and systems, and use algebra to solve word problems. Algebraic manipulation is practiced throughout the rest of the course as students work with limits, rates of change, trigonometric expressions, complex numbers, series, conic sections, and area under the curve.

Careful consideration was given to the sequencing of the concepts in the course to allow for mastery over time while meeting the content standards of a 4th year course. The book is designed to be a year-long course and allows teachers to choose topics that fit the needs of their students. One option using this text is a course that focuses on the 4th year math standards: algebra, functions, trigonometry, complex numbers, conic sections, probability, vectors, and matrices. Another option is a course that focuses on Calculus readiness with topics such as rates of change, limits, and area under the curve.

Department:	**Mathematics**
Course Title:	Precalculus (*Formerly Math Analysis)* ***Cengage**
School(s) Course Offered:	Clark Magnet High School, Crescenta Valley High School, Hoover High School, Verdugo Academy
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated III
Recommended Textbook:	Precalculus: Mathematics for Calculus James Stewart, Lothar Redlin, Saleem Watson Cengage Learning Seventh Edition
Course Overview:	Precalculus is a 4th year high school mathematics course to solidify and explore deeper concepts and content that students have seen before as well as introducing some new concepts to help prepare them for more advanced mathematics. This course meets all the Common Core state standards for a fourth-year of high school mathematics and is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson and chapter.

Department:	**Mathematics**
Course Title:	Precalculus Honors (*Formerly Honors Math Analysis)* ***CPM**

School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated III
Recommended Textbook:	Precalculus Josea Eggink, Samantha Falkner, Emily Kaffel, Mark Ray, Jeanne Villeneuve, Karen Wooton, Erin Yao CPM Educational Program Third Edition
Course Overview:	Precalculus meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking. The course is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson. With the emergence of new technology, many lessons have moved beyond a traditional handheld device and are written with Desmos eTools as an integral component. The curriculum contains several key labs and hands-on activities to introduce and connect concepts, with an emphasis on modeling.

A focus on algebra is woven throughout the course. Students investigate equivalent expressions and practice setting up word problems right from the start. Students use algebra to manipulate inverse, composite, and piecewise-defined functions as well as investigate characteristics of functions and transformations of functions. Students continue rewriting expressions, solving complicated equations and systems, and use algebra to solve word problems. Algebraic manipulation is practiced throughout the rest of the course as students work with limits, rates of change, trigonometric expressions, complex numbers, series, conic sections, and area under the curve.

Careful consideration was given to the sequencing of the concepts in the course to allow for mastery over time while meeting the content standards of a 4th year course with focus on the 4th year math standards: algebra, functions, trigonometry, complex numbers, conic sections, probability, vectors, and matrices.

This courses covers the same material as Precalculus and adds rates of change, limits and area under the curve.

Department:	**Mathematics**
Course Title:	Precalculus Honors (*Formerly Honors Math Analysis)* ***Cengage**
School(s) Course Offered:	Clark Magnet High School, Crescenta Valley High School, Hoover High School, Verdugo Academy
UC/CSU Approved (Y/N, Subject):	Y, mathematics "c"
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated III

Recommended Textbook: Precalculus: Mathematics for Calculus
James Stewart, Lothar Redlin, Saleem Watson
Cengage Learning
Seventh Edition

Course Overview: Precalculus is a 4th year high school mathematics course to solidify and explore deeper concepts and content that students have seen before as well as introducing some new concepts to help prepare them for more advanced mathematics. This course meets all the Common Core state standards for a fourth-year of high school mathematics and is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson and chapter.

This courses covers the same material as Precalculus and adds rates of change, limits and area under the curve.

Glendale Unified School District

Middle School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Math 8A Summer Acceleration (Summer Bridge A)
Course Code:	3140J8/3141J8
School(s) Course Offered:	Wilson, Toll, Roosevelt, Rosemont
UC/CSU Approved (Y/N, Subject):	No
Course Credits:	Full Year (10) (Summer only)
Recommended Prerequisite:	Math 7 *and* teacher recommendation
Recommended Textbook:	*enVisionmath2.0: Accelerated Grade 7*, Pearson
Course Overview:	This course is intended for students wishing to accelerate to Math 8B/Integrated I Accelerated in 8th grade, after completing Math 7 with an A and a teacher recommendation. This course covers half of the year-long Math 8 standards, as defined by California State Standards. Topics included are irrational numbers, exponent rules, graphing proportional relationships, solving one variable equations and inequalities, properties of transformations, properties of lines, and volume of circular solids. Placement in Math 8B/Integrated I Accelerated is dependent upon passing Math 8A Summer Acceleration with the grade of A or B. The standards covered in this course are 8th grade standards that were covered in Math 7/8A Accelerated.

Course Content:

Unit 1: **Real Numbers** *(6 days)*

STANDARDS
8.NS.1, 8.NS.2, 8.EE.2, 8.EE.3, 8.EE.4

A. As stated on page 80C of the Teacher Edition:
In this unit, students make the connection that repeating decimals are rational numbers because they can be written as fractions. Students explore irrational numbers and recognize perfect squares. They learn that real numbers are either rational or irrational, and compare and order rational and irrational numbers. Students evaluate square and cube roots and extend this knowledge by solving equations using square roots and cube roots. They multiply and divide exponential expressions with the same base and multiply exponential expressions with different bases. Students use properties of exponents to simplify expressions. Students will perform operations with numbers in scientific notation.

B. Sample Activity and Assignment:
Students will participate in a 3-Act Math Task where they view a video of heart beats on a heart monitor. Students then must determine a mathematical question they can ask and answer based on the video and what information they must find to solve the problem. While engaging in this task, students will estimate the answer to the question of how many times one's heart beats in a decade. Students must use exponent rules, scientific notation, and operations with scientific notation to determine and justify their estimates.

Unit 2: **Analyze and Solve Linear Equations** *(5 days)*

STANDARDS
8.EE.7a, 8.EE.7b, 8.EE.5, 8.EE.6

A. As stated on page 384C of the Teacher Edition:
In this topic, student collect like terms from one or both sides of an equation to solve problems using the Distributive Property and inverse operations. Student determine whether an equation has zero, one, or infinitely many solutions. Student compare proportional relationships by computing unit rates and using linear graphs, equations and tables. They find relationships between proportional relationships and slope of a line. Students extend their understanding of linear equations to include non-zero y-intercepts, leading to equations in the form of $y = mx + b$.

B. Sample Activity and Assignment:
At the end of the unit, students will be given a performance assessment which includes student comparing the cost of renting a climbing wall from two different companies. One company's costs are represented in a graph, while the other's cost is represented in a table. Students need to determine which company is most cost effective and defend their answer.

Unit 3: **Congruence and Similarity** *(5 days)*

STANDARDS
8.G.1a, 8.G.1b, 8.G.1c, 8.G.3, 8.G.2, 8.G.4, 8.G.5

A. Students learn to translate a figure and identify and verify the transformation, and its properties. Students describe sequences of transformations, as well as identify center of rotation and angle of rotation. Students make sense of dilations and make sense of scale factors. Students use what they have learned about transformations to understand and verify similarity and congruency of figures. Students learn about the relationship of angles formed by parallel lines and a transversal, as well as using this information to determine missing measurements of the interior and exterior angles of a triangle.

B. Sample Assignments:
1. Students will use the online graphing program Geogebra to explore similarity and congruence of figures and describe the sequences performed.
2. Students will cut out L shaped pieces and perform a series of transformations on a coordinate plane and record the position of each of the vertices of the original and the transformed figures.

Unit 4: **Solving Problems Involving Surface Area and Volume** *(4 days)*

STANDARDS
8.G.9

A. As described on page 716C of the Teacher Edition:
Students determine the surface area of a cones and cylinders by decomposing the shape into a net. The surface are of a sphere is calculated through examination of the relationship between the surface area of a cone and the surface area of a sphere. Students find the volume of a cone by applying a similar procedure to the volume of a right prism. Students examine the differences and similarities between the formulas for volumes of cones and cylinders and between the formulas for the volumes of cones and spheres.

B. Sample Assignment:
Students participate in a 3-Act Math task where they must predict whether the contents of a given flask (shaped like a cone with a cylinder on top) will fit into a given cylinder. Students must determine that they need to know the dimensions of both containers, as well as recognize that the flask has a smaller cone (the tip of the imaginary cone) removed and replaced by a cylinder. Students will need to decompose the flask into two solids.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Integrated Math IIIA – Accelerated (Summer Bridge B)
Course Code:	3515JH/3516JH
School(s) Course Offered:	Crescenta Valley High School, Hoover High School
UC/CSU Approved (Y/N, Subject):	No
Course Credits:	10, Full Year, elective credit, Summer School only
Recommended Prerequisite:	Integrated Math II, teacher approval
Recommended Textbook:	*California Integrated Mathematics 3* Timothy D. Kanold, Edward B. Burger, Juli K. Dixon, Matthew R. Larson, Steven J. Leinwand Houghton Mifflin Harcourt 2015
Course Overview:	Integrated Mathematics IIIA Accelerated is the summer bridge course for students who have completed Integrated II and would like to accelerate into Integrated IIIB/Precalculus Accelerated the following year. Integrated IIIB/Precalculus is a year and a half course. Along with this course, students will have completed all the standards in Integrated III and Precalculus in one summer and one school year. This course will strengthen and build on students' previous knowledge from Integrated Mathematics I and II standards. This course will focus on polynomial expressions and functions, quadratic functions and equations, rational functions and equations, radical functions and equations.

Course Content:

Unit 1: **Measurement and Modeling in Two and Three Dimensions**

STANDARDS
G-GMD.4, G-GMD.5, G-MG.1

A. Students will learn about cross sections and solids of rotation. They will utilize formulas to calculate the surface area of prisms, cylinders, pyramids, cones, and spheres. Students will work with geometric probability and scale factor. They will explore the differences between Euclidean and spherical geometry.

Major Topics:
Cross sections and solids of rotation
Formulas for the surface area of a prism, cylinder, pyramid, cone and sphere
Scale factor
Calculating density
Modeling to meet constraints

B. Unit Assignment(s):
At the end of this unit, students will complete a Math in Careers task relating to a scale model of a sphere. Critical skills include finding a scale factor and applying knowledge of spherical geometry. Students will experience how a model maker uses mathematics on the job.

Mathematical Practices Used in Unit:

- MP.1 - Students will make sense of problems when they use multiple formulas to find the surface area and/or volume of composite solids.
- MP.2 - Students must reason abstractly to visualize the cross sections of solids. Students relate the properties of three-dimensional figures (faces, vertices, and intersections of planes) and their rotational symmetry to help identify cross sections of solids. Students will use their knowledge of surface area of spheres and scale to find actual distances on the globe.
- MP.4 - Students represent real-world problems with mathematical models when they find the density of real-life objects as the weight or mass per unit of volume, and extend that idea to density to population density, or the population of a region per unit area of the region.
- MP.8- Students will decompose solids into two-dimensional shapes for finding surface area and determine shortcuts (formulas) for finding surface area of prisms and cylinders. Students will apply their knowledge of two- and three- dimensional figures to describe the transformation of figures by scale factor *a.*

Unit 2: **Polynomial Functions, Expressions, and Equations**

STANDARDS
F-IF.4, F-IF.4, A-APR.1, A-APR.2, A-APR.5, A-APR.6, A-SSE.2

A. Students will learn about transforming function graphs and inverses of functions. They will perform operations on polynomials. Student will expand their ability to solve equations by finding rational and complex solutions.

Major Topics:
Transforming function graphs and inverses of functions
Graphing cubic and polynomial functions
Operations with polynomials
Binomial theorem
Finding rational and complex solutions of polynomial equations

B. Unit Assignment(s):
After completing this unit, students will complete a performance task by evaluating and subtracting quadratic functions representing the labor force of the United States. Critical skills include evaluating polynomial functions and operations with polynomials.

Using data from the U.S. Census Bureau, the students will be provided with two functions for approximating the labor force, one for the total number of workers and one for the number of female workers. First, students will use the functions to calculate the two estimates for the number of workers. Next, students will work in pairs to write a polynomial function that models the number of male workers and will explain to another pair how they found their function. Finally, students will discuss, as a class, alternative strategies for determining the number of males without using the function they wrote.

Mathematical Practices Used in Unit:

- MP.1, MP.3 - Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they discuss factored form of a polynomial, describe the graphs of polynomials, and develop their understanding of polynomial division.
- MP.2, MP.7, MP.8 - Students will reason abstractly and quantitatively, look for and make use of structure, and look for and express regularity in repeated reasoning as they make connections between the transformations of quadratic functions and transformations of polynomial functions. Students will also understand the relationship between a function and its inverse.
- MP.7 - Students will also look for and make use of structure as they draw graphs of polynomials, and use polynomial division to determine factors of polynomials and how those factors relate to the zeros of the function.

Unit 3: **Rational Functions, Expressions and Equations**

STANDARDS
F-IF.7d, A-APR.7, A-REI.2

A. Students will learn about graphing rational functions. They will perform operations on rational expressions. Students will graph and solve rational equations.

Major Topics:
Graphing simple and complex rational functions
Adding, subtracting, multiplying and dividing rational functions
Solving rational equations

B. Unit Assignment(s):
After finishing this unit, students will complete a Math in Careers task by writing, analyzing, and graphing a function representing the concentration of acid in a mixture. Critical skills include representing real-world situations using rational functions, determining domain and range, and interpreting asymptotes.

Students will write a rule for a function that represents a specific acid and water mixture. Students will determine a reasonable domain for their function and explain to a partner. They will graph the function labeling the axes with the quantities they represent and indicate the axis scales. With a partner, a student will analyze the function's rule to determine the vertical and horizontal asymptotes and determine their relevance or irrelevance.

Mathematical Practices Used in Unit:

- MP.7, MP.8 - Students will look for and make use of structure as well as look for and express regularity in repeated reasoning as they connect multiplication and division of fractions to that of rational expressions, and make connections between adding and subtracting fractions and adding and subtracting rational expressions.
- MP.7 - Look for and make use of structure as they graph rational functions with the parameters a, b, h, and k.
- MP.3 - Students will construct viable arguments as they solve rational equations graphically to find the zeros of the function, and algebraically by rewriting an equivalent polynomial equation to solve the original rational equation.

Unit 4: **Radical Functions, Expressions and Equations**

STANDARDS
F-BF.4a, F-IF.7b, N.RN.1, A-REI.2

A. Students will learn about inverses of quadratic and cubic functions. They will graph square and cube root functions. Students will simplify and solve radical equations.

Major Topics:
Inverses of simple quadratic and cubic functions
Graphing square and cube root functions
Radical expressions and rational exponents
Simplifying radical expressions
Solving radical equations

B. Unit Assignment(s):
Upon finishing this unit, students will do a performance task in which they will take on the role of a nutritionist. Students will find a quadratic function that models BMI data. Critical skills include fitting a function to data, finding the appropriate domain and range, and finding the inverse of a function.

Given the median BMI measures for a group of boys, students will create a scatter plot for the data. They will find a quadratic regression model for the data and explain their model. Students will then work with a partner to determine the domain and its restrictions for both the data set and its inverse. Lastly, students will graph the inverse of the function and determine what it models.

Mathematical Practices Used in Unit:

- MP.1 - Students will make sense of problems and persevere in solving them as they use various strategies to solve radical equations, and to obtain extraneous solutions.
- MP.4 - Students will explore how a function and its inverse can both model a given real-world situation.
- MP.7 - Students will look for and make use of structure about how the various parameters, a, b, h, and k, affect the graph of a square-root and cubic function, in relation to a quadratic and cubic function respectively.

Unit 5: **Properties of Circles**

STANDARDS
G-C.1, G-C2, G-C.3, G-C.5, G-GMD.1, G-GPE.1

A. Students will learn relationships among inscribed angles, radii, chords, secants and tangents. They will derive and apply the formula for arc length and sector area and convert degree to radian measure.

Major Topics:

- Central, inscribed and circumscribed angles
- Relationship of radii to chords and tangents

- Tangents to a circle
- Radian measure
- Arc length and sector area

B. Unit Assignment(s):

After finishing this unit, students will complete a Math in Careers task by using knowledge of the properties of circles in the context of an astronomical event. Critical skills include modeling real world situations and applying theorems about tangents, secants and arc measures in a circle. With a partner, students will create a diagram to make sense of the problem and label the given information. Students will determine the best method to calculate the degree of the arc where the eclipse may be observed. Once the measure of the arc is known, students can calculate the length of the arc.

Mathematical Practices Used in Unit:

- MP.4 - Students will model with mathematics as they apply what they know to solve problems involving circles. For example, students will find the distance between the Space Station and Earth's horizon.
- MP.3 - Students construct viable arguments and critique the reasoning of others when they answer the question, "Is it possible for 50% of the Earth's equator to be within range of a satellite's signal?"
- MP.8 - Students will look for and express regularity in repeated reasoning to understand that the radian measure is the constant of proportionality between the length of an arc of a circle and its radius.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Integrated Math IIIA – Accelerated (Summer Bridge B)
Course Code:	3515J/3516J
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	No
Course Credits:	10, Full Year, elective credit Summer School only
Recommended Prerequisite:	Integrated Math II, teacher approval
Recommended Textbook:	*Core Connections Integrated III* Judy Kysh, Evra Baldinger, Michael Kassarjian, Karen Wootton, et. al CPM Educational Program Second Edition, Version 5.0
Course Overview:	Integrated Mathematics IIIA Accelerated is the summer bridge course for students who have completed Integrated II and would like to accelerate into Integrated IIIB/Precalculus Accelerated the following year. Integrated IIIB/Precalculus is a year and a half course. Along with this course, students will have completed all the standards in Integrated III and Precalculus in one summer and one school year. This course will strengthen and build on students' previous knowledge from Integrated Mathematics I and II standards. This course will focus on polynomial expressions and functions, quadratic functions and equations, rational functions and equations, radical functions and equations.

Course content:

Unit 5: **Inverses and Logarithms**

STANDARDS
F-BF.3, F-BF-4, F-BF.4a, F-LE.4, F-LE.4.2, I-IF.7e

A. Reversing is an important theme in the early part of this chapter. The first section introduces the concept of inverse relations. Students learn that reversing, or working backward to undo the action of a function, can create a new function. They explore multiple representations of functions and their inverses, and recognize that many functions have inverses that are not functions. In the second, students determine inverses of parent functions. They learn that the inverse of an exponential function is a logarithm. Reversing is emphasized once again as they learn how to convert exponential equations into logarithmic form, and vice versa. Students investigate the new family of logarithmic functions $f(x) = \log_b(x)$ for different values of b, test values on their calculators to determine the base the calculators work in, and learn to graph transformations of $f(x) = \log(x)$.

Progression of Content:
This chapter adds to students' lists of parent functions, which will continue to expand with the addition of polynomial functions in Unit 8 and trigonometric functions in Unit 9.

B. Unit Assignment(s):
Mathematics Practices used in Unit 5:

- Students will look for and make use of structure and construct viable arguments as they develop and justify strategies for undoing functions and as they investigate different bases for logarithms..
- Students will use appropriate tools strategically and look for and make use of structure when they graph inverses of functions and write their equations.
- Students will look for and make use of structure as they verify inverses using multiple representations, and attend to precision as they restrict the domain of a function to ensure that its inverse is also a function.
- Students will construct viable arguments and critique the reasoning of others and look for and make use of structure as they apply their knowledge of parent graphs and inverses to learn about logarithms.
- Students will look for and make use of structure and express regularity in repeated reasoning as they learn the definition of logarithm and calculate the values of logarithms.
- Students will construct viable arguments and critique the reasoning of others, use appropriate tools strategically, and look for and make use of structure as they investigate logarithms with different bases.

Sample Activities:
Guess My Number Game - Students are asked to guess the number the teacher is thinking of based on the order of operations applied to the number and what the mystery number has ultimately transformed into. Students may or may not write an equation, but you may want to encourage them to do so as it will help when they progress to working with functions and inverses. Making sure that the idea of reversing, or undoing, comes up in the discussion of the "Guess My Number" game. You undo each step, reversing the original Order of Operations.

Graph the Inverse Function - Students will be looking at strategies for creating graphs of inverse functions. The first two graphs have functions that they are capable of finding the equation of their inverse functions but the third function does not lend itself to be solved for the inverse function. Teams could make a mini-table of some coordinates from the graph and then use it to help make a mini-table for the inverse graph. Students will soon discover that the line $y = x$ is the line of symmetry.

Unit 7: **Logarithms and Triangles**

STANDARDS
F-LE.3, F-LE.4, F-LE.4.1, F-LE.4.3, A-SSE.2, F-BF.1, F-IF.7e, G-SRT.9+, G-SRT.10+, G-SRT.11+

A. In this unit, students return to their work with logarithms to develop tools they can use when solving application problems involving exponential equations. In the first half of this unit, students investigate the family $y = \log(m^n)$ and discover the Power Property of Logarithms, which allows them to solve exponential equations by using logs to undo or rewrite the equation. Students generalize from number patterns to make conjectures about other properties of logarithms and then prove these properties. Furthermore, students develop and share strategies to write the equation of the exponential function with a given asymptote that passes through two given points. Then they use that equation to make predictions.

The remainder of this unit focuses on completing a tool kit for calculating missing parts of non-right triangles. Students identify the types of information needed to determine all of the missing sides and angles of a triangle. Through this exercise, students also identify triangles for which they do not yet have the tools to determine missing parts. Students notice that they *do* have enough tools to calculate the measures and side lengths of right triangles. This leads to the question, "*What if the triangle is not a right triangle?"* Students then develop the Law of Sines and Law of Cosines so that they have a complete set of tools to determine the other missing parts of any triangle (when sufficient information is provided).

The unit concludes with students looking at different application problems using triangles and identifying which tools are most useful in each situation. In addition, students investigates the ambiguous case of triangles: SSA. This lesson is offered for accelerated

classes or those that could benefit from a complete view of the relationships between the sides and angles of a triangle. Working through the problems of this lesson before you decide to use the lesson with your students is highly recommended.

Progression of Content:
The work with logarithms in this unit prepares students for future work in a pre-calculus course. Working with Law of Sines and Cosines and reviewing the use of right triangle trigonometry and special right triangles prepares students for working with the trigonometric family of functions in Unit 9.

B. Unit Assignment(s):

Mathematics Practices used in Unit 7:

- Students will look for and make use of structure and express regularity in repeated reasoning while they develop the Power Property of Logarithms, learn other properties of logs and how to rewrite equations with different bases.
- Students will make sense of problems and reason abstractly and quantitatively as they write the equation of an exponential function given two points and an asymptote.
- Students will make sense of problems and persevere in solving them, model with mathematics, and reason abstractly and quantitatively as they explore exponential functions with an asymptote other than $y = 0$ and apply logarithms to solve an exponential equation.
- Students will make sense of problems and persevere in solving them as they figure out what information they need to solve for parts of triangles. They will need to attend to precision as they communicate what they know and do not know.
- Students will look for and express regularity in repeated reasoning as they develop the ratios for the Law of Sines.
- Students will make sense of problems and persevere in solving them using the Law of Cosines.
- Students will attend to precision as they work with triangles involving the SSA relationship. They must also use appropriate tools strategically as they explore the ambiguous case of the Law of Sines.
- Students will reason abstractly and quantitatively as they make sense of problems and persevere in solving them. They will attend to precision as they solve the problems and communicate within their teams, labeling diagrams, attending to units, and calculating their answers accurately.

Sample Activities:
"The Case of the Cooling Corpse" - a problem in which students model the falling temperature of a corpse to establish time of death and solve a murder mystery. In order to solve the mystery, students will need to decide which information is relevant to solving the problem (e.g., body temperature, times listed on sign-in sheets, etc.). Students will need to write and solve a system of exponential functions, with a horizontal asymptote representing the room temperature, the independent variable as time, and the dependent variable as the temperature of the body.

Solving Triangles - This activity consists of eight independent triangle problems (suggestion is to assign one problem to a group of 3-4 students) that will provide students with a chance to consolidate their understanding of the various tools and strategies they have developed so far to solve triangle problems. Some problems may be solved using the Law of Sines, Law of Cosines, or a combination of both. Students will present their assigned problem to the entire class and their process for solving the assigned problem.

Unit 8: **Polynomials**

STANDARDS
A-APR.1, A-APR.2, A-APR.4, A-APR.6, A-APR.3, F-IF.4, F-IF.7c, N-CN.8+, N-CN.9+, A-SSE.2, A-CED.2, F-BF.1

A. In the first section, students will investigate the equation ↔ graph connections for polynomial functions. They will recognize that equations in factored form are much easier to sketch, and they will understand the relationship between the factors and the x-intercepts of the graph. Then, in the second section, they will develop an understanding of imaginary and complex numbers and recognize that polynomial functions can have complex roots. In the third and last section, they will learn to divide polynomials by a known factor to find other factors. This will allow them to determine complex and irrational roots of some cubic and quartic functions.

Progression of Content:
Students will build on their understanding of function families in Unit 9, where they study trigonometric functions and transform the graphs of sine and cosine functions. Students will use their algebra skills when they study rational expressions in Unit 11. Students will also use their algebra skills when they prove formulas for sums of series in Unit 10 and solve trigonometric identities in Unit 12.

B. Unit Assignment(s):
Mathematics Practices used in Unit 8:

- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they discuss factored form and describe the graphs of polynomials and their understanding of the stretch. Students will also look for and make use of structure as they draw graphs of polynomials.
- Students will look for and make use of structure as they continue their polynomial investigation. Students will also construct viable arguments and critique the reasoning of others as they consolidate their results on polynomials.
- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they develop their understanding of a stretch factor. Student will also model with mathematics as

they develop an equation for the roller coaster problem first introduced in the first lesson of Unit 8.

- Students will look for and make use of structure as they use polynomial division to determine factors of polynomials. Students will also construct viable arguments and critique the reasoning of others as they develop their understanding of polynomial division.
- Students will look for and make use of structure as they use complex roots to write equations of quadratic functions and express regularity in repeated reasoning as they identify polynomial identities to help them factor. Students will also look for and express regularity in repeated reasoning as they identify patterns in the sums and products of complex roots.
- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others when they determine all roots of a polynomial with a degree greater than two and when they determine all roots of a polynomial with a degree greater than two.

Sample Activities:
Polynomial Function Investigation - Students are instructed to look for, label, and describe the x-intercepts and "bounces" (double roots, although students will probably not use this term), the y-intercept, the number of turns, and the behavior of graphs for very large and very small x-values. They should share and discuss all of their graphs and their observations within their teams. The discussion should lead to conjectures and the creation of several new equations to try. Students are coming up with methods for determining the x- and y-intercepts, predictions about the numbers of crossings of the x-axis, and ideas for determining a reasonable window or maximum and minimum approximations.

Game of Polydoku - By treating division as a puzzle and using the organizational device of an area model, students can use logical reasoning to reverse the multiplication process and figure out a missing factor. Once they have worked through the process several times, they should be able to set up and solve their own division problems. This method is as efficient as (if not more efficient than) polynomial "long division" and you can use it to develop synthetic division if that is part of your curriculum. This game introduces polynomial division by challenging students to reverse the process of polynomial multiplication.

Unit 11: **Rational Expressions and Three-Variable Systems**

STANDARDS
A-APR.7+

A. In this chapter, students will focus on operations with rational expressions. Students did a function investigation in Unit 1 that previewed the investigation of rational expressions. Students learn a powerful method of simplifying rational expressions that uses properties of the number 1 and the properties of exponents. In a previous course,

students learned to solve a system of two linear equations in two variables, and they reviewed this topic in Chapter 3 of this text.

Progression of Content:
The remaining chapter requires students to use their algebra skills to solve trigonometric identities. In future courses, students may use matrices to solve systems of equations.

B. Unit Assignment(s):
Mathematics Practices used in Unit 11:

- Students will look for and make use of structure as well as look for and express regularity in repeated reasoning as they use the number 1 to understand rational expressions.
- Students will also look for and make use of structure as well as look for and express regularity in repeated reasoning as they connect multiplication and division of fractions to that of rational expressions.
- Students will look for and make use of structure as they make connections between adding and subtracting fractions and adding and subtracting rational expressions, and as they locate points in three-dimensional space. They will construct viable arguments and critique the reasoning of others as they justify their strategies.
- Students will continue to look for and make use of structure as well as look for and express regularity in repeated reasoning as they work with rational expressions. They will construct viable arguments and critique the reasoning of others as they investigate the closure of rational expressions under operations.
- Students will reason abstractly and quantitatively and look for and express regularity in repeated reasoning as they write the equation of a quadratic function by solving a system of three equations with three unknowns.

Sample Activity:
Giant One - Students are encouraged to rewrite rational expressions to create fractions that will reduce to one. The new expressions will be reduced to its simplest form. This strategy to rewrite will allow students to simplify rational expression after doing basic operations on the original expressions.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Integrated Math III
Course Code:	3513D/3514D
School(s) Course Offered:	Glendale High School, Clark Magnet High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated Math II A/B
Recommended Textbook:	*Core Connections Integrated III* Judy Kysh, Evra Baldinger, Michael Kassarjian, Karen Wootton, et. al CPM Educational Program Second Edition, Version 5.0
Course Overview:	Integrated Mathematics III aims to apply and extend what students have learned in previous courses by focusing on finding connections between multiple representations of functions, transformations of different function families, finding zeros of polynomials and connecting them to graphs and equations of polynomials, modeling periodic phenomena with trigonometry, and understanding the role of randomness and the normal distribution in making statistical conclusions. On a daily basis, students in this course use problem-solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating rigorous arguments justifying their

thinking. Under teacher guidance, students learn in collaboration with others while sharing information, expertise, and ideas.

The course is well balanced between procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (extension and transference). The lessons in the course meet all of the content standards, including the "plus" standards, of Appendix A of the *Common Core State Standards for Mathematics*. The course imbeds the CCSS Standards for Mathematical Practice as an integral part of the lessons in the course.

Key concepts addressed in this course are:

- Visualize, express, interpret and describe, and graph functions (and their inverses, in many cases). Given a graph, students will be able to represent the function with an equation, and vice-versa, and transform the graph, including the following function families: absolute value, exponential, linear, logarithmic, piecewise-defined, polynomial, quadratic, square root, trigonometric.
- Use of variables and functions to represent relationships given in tables, graphs, situations, and geometric diagrams, and recognize the connections among these multiple representations.
- Application of multiple algebraic representations to model and solve problems presented as real world situations or simulations.
- Solving linear or quadratic equations in one variable, systems of equations in two variables, and linear systems of equations in three or more variables.
- Use of algebra to rewrite complicated algebraic expressions and equations in more useful forms.
- Rewriting rational expressions and arithmetic operations on polynomials.
- The relationship between zeros and factors of polynomials.
- Operations with complex numbers, and solving quadratics with complex solutions.
- Applications of the Law of Sines and Law of Cosines.
- Modeling periodic phenomena with trigonometric functions.
- Calculating the sums of arithmetic and geometric series, including infinite geometric series.
- Concepts of randomness and bias in survey design and interpretation of the results.
- Use of a normal distribution to model outcomes and to make inferences as appropriate.
- Use of computers to simulate and determine complex probabilities.
- Use of margin of error and sample-to-sample variability to evaluate statistical decisions.
- Solving trigonometric equations and proving trigonometric identities.
- Understand logarithms and their inverse relationship with exponentials.
- Use logarithms to solve exponential equations.

Course Content:

Semester A

Unit 1: **Investigations and Functions** *(approximately 14 days)*

STANDARDS
F-IF.4, F-IF.7b, F-BF.1, A-APR.1

A. This unit starts a focus on investigation and justification that continues throughout the course as students formulate and investigate mathematical questions and create logical and convincing arguments to support their findings. Students use a graphing calculator to create multiple representations of a function, and review how to fully describe the graph of a function using precise mathematical language. Students are also introduced to the way a parent graph and parameters define a family of functions. Modeling mathematical problems is a big emphasis from the start.

Progression of Content:
The investigation strategies students have developed throughout the course, especially in this unit, will continue to be used and further elaborated in future units as they study logarithmic, inverse, polynomial, and trigonometric functions.

B. Unit Assignment(s):
Mathematics Practices used in Unit 1:
- Look for and Make Use of Structure as they determine which inputs and outputs are possible for each type of function.
- Construct Viable Arguments and Critique the Reasoning of Others as they determine the order for the function machines.
- Use Appropriate Tools Strategically as they learn features of the graphing calculator.
- Attend to Precision as they graph functions with asymptotes and use proper vocabulary when describing statistical data.
- Look for Regularity in Repeated Reasoning as they investigate a family of functions by changing a parameter.
- Reason Abstractly and Quantitatively as they model the relationship between height and volume of rectangular prisms.

Sample Activities:
Function Exploration - Each group of students will be given a radical function to fully investigate. They will make a complete graph and describe it using the following attributes: shape, line of symmetry, asymptotes, increasing or decreasing, x- and y-intercepts, domain and range, endpoints, maximum or minimum points, continuous or discrete, and whether or not it is a function. After all graphs have been presented to the class, a discussion will follow that will discuss the similarities and differences between the graphs.

Open Box - Modeling a geometric relationship, each group of students will be given six equally sized sheets of grid paper. They will cut the corners from the paper and fold it to make a box without a lid. After making several boxes, students will use multiple representations (table, diagrams and graph) to determine which box has the greatest volume. Students will then generalize their results by writing an equation to represent the volume with height x. Using technology, students will find the height of the box with the largest possible volume.

Unit 2: **Transformations of Parent Graphs** *(approximately 17 days)*

STANDARDS
F.BF.1, F.BF.3, F-IF.4, F-IF.5, F-IF.6, F-IF.7b, F-IF.7e, A-CED.2, A-SSE.1b, G-GPE.3.1

A. In this unit, students learn how to generate families of functions from parent functions. Students develop a general equation of form f(x) = a(x – h)^2 + k for the family of quadratic functions and learn to graph a parabola quickly by identifying its orientation, vertical stretch (or compression), and vertex. Students then continue to generalize families of functions by applying the same kinds of transformations to other parent functions, describing the role of the locator point (h, k) for each family of functions.

Progression of Content:
The idea of families of functions will be revisited several times throughout this course and the next. Each time students are introduced to a new parent functions (e.g., inverses and logarithmic functions in Unit 5), they will be asked to graph members of its family and write an equation in graphing form for the family. The members of a family of functions are all related to a parent function and to each other by a sequence of transformations. As students gain familiarity with the properties of new functions, they will build their ability to choose the appropriate function to model a particular relationship.

B. Unit Assignment(s):
Mathematical Practices used in Unit 2:
- Look for and Make Use of Structure when they graph quadratic functions and rewrite the equations of quadratic functions from standard form to graphing form; make connections between the transformations of parabolas and other parent graphs; apply knowledge of parabolas and other parent functions to identify the locator point (h, k) for different families of functions; explore odd and even functions; and complete the square for equations of parabolas and circles and identify the vertex or center and radius.
- Model with Mathematics as they write quadratic functions to represent relationships, check the reasonableness of their answers, and make predictions.
- Look for and Express Regularity in Repeated Reasoning as they explore transformations of graphs that are not functions.

Sample Activities:
Transforming Other Parent Graphs - Having transformed quadratic equations earlier in the chapter, students will now discover the transformations of five other parent graphs. Each group will organize their work into a poster that clearly shows: each parent graph, examples of transformations and each equation in graphing form. As a challenge for the other groups, each poster will also show a graph for which other teams need to write the equations and will give an equation for each of the other teams to graph.

Unit 3: **Solving and Inequalities** *(approximately 14 days)*

STANDARDS
A-APR.4, A-REI.2, A-REI.11, A-SSE.1b, A-SSE.2, A-CED.2, A-CED.3, F-BF.1, F-IF.4

A. In this unit, students are asked to think about or visualize the kinds and number of solutions that an equation, inequality, or system of equations or inequalities might have. Another main focus is the application of equations, inequalities, and systems to solve problems. Students will use graphing as a powerful method for solving equations and systems as well as for visualizing the solutions, then reverse the process, when given solutions and asked to visualize the graphs.

Progression of Content:
Students will return to the focus on solving and solutions in the first section of Unit 11, when they will extend their ideas to solving systems of equations with three variables. At the end of that section, they will return to the idea of applications of systems as they solve a system of three equations with three variables to determine the equation of a parabola, $y = ax^2 + bx + c$, that passes through three known points. One benefit of solving equations by graphing is that students soon face equations that they cannot solve using algebraic methods, so they need to use graphing to determine a solution. Graphing becomes a very powerful mathematical tool that students can use to solve polynomial equations in Unit 8 and trigonometric equations in Unit 9.

B. Unit Assignment(s):
Mathematics Practices used in Unit 3:

- Look for and Make Use of Structure as they choose methods for solving linear and nonlinear equations and inequalities.
- Attend to Precision when determining and verifying solutions graphically and algebraically.
- Model with Mathematics as they use systems of equations to model and analyze situations, including problems with constraints to determine an optimal solution.

Sample Activity:
How Tall is Harold? - After learning to solve systems of equations both algebraically and graphically, students are given a scenario in which foods in a food fight hit Harold in the head. Given information about the flight of the food and Harold's distance from the food, students will

model both graphically and algebraically and from their models, they will determine Harold's height.

Unit 4: **Normal Distributions and Geometric Modeling** *(approximately 14 days)*

STANDARDS
S-IC.1, S-IC.2, S-IC.3, S-IC.4, S-IC.5, S-IC.6, G-GMD.4, G-MG.1, G-MG.3

A. In this unit, students will begin their studies of the fundamentals of designing studies and experiments, as well as their limitations. The importance of random sampling for studies and random assignment for experiments is stressed. Students begin by looking at surveys, and gain experience with two common sources of bias in those surveys. Students will next perform an experiment to help them compare and contrast experiments with observational studies (such as opinion surveys), stressing distinctions between experiments and observational studies. Relative frequency histograms will record the data, and will be modeled with normal distributions. Finally, students focus on geometric modeling, looking at cross-sections and solids of revolution.

Progression of Content:
Designing studies and experiments and using normal density curves as models to calculate probabilities is important for Unit 6. In Unit 6, students begin to explore inferential statistics, using samples to make predictions about populations.

B. Unit Assignment(s):
Mathematics Practices used in Unit 4:
- Construct Viable Arguments and Critique the Reasoning of Others as they write research questions and consider issues of bias, explore convenience sampling and try to incorporate some level of random selection into their own sampling for their survey, and explore the differences between observational studies, surveys, and experiments.
- Model with Mathematics as they explore randomly selected samples and samples selected intentionally, explore the impact of a lurking variables, and compare relative frequency histograms to normal probability density models.
- Use Appropriate Tools Strategically as they create relative frequency histograms and explore statistics with their calculator.
- Reason Abstractly and Quantitatively as they continue to explore normal distributions and predict percentiles.

Sample Activities:
Conclusions from Studies - After learning about survey design, samples, randomness and bias, students will write their own survey questions. After gathering data, they will use histograms, percentile, and a normal probability density function to determine if their data is valid. They will then be given an opportunity to run an experiment, adjust the experiment, and re-evaluate their data.

How Can I Get That Cross-Section? - In order to show students that volumes of solids can be found using cross- sections, they are first asked to slice a cube to get different cross-sections. Students will be given a glob of clay that they must first make into a cube. Using dental floss to slice the cube, students will slice the cube to get 4 different cross-sections: a square, a rectangle that is not a square, a triangle, and a hexagon.

Unit 5: **Inverses and Logarithms** *(approximately 11 days)*

STANDARDS
F-BF.3, F-BF-4, F-BF.4a, F-LE.4, F-LE.4.2, I-IF.7e

A. Reversing is an important theme in the early part of this chapter. The first section introduces the concept of inverse relations. Students learn that reversing, or working backward to undo the action of a function, can create a new function. They explore multiple representations of functions and their inverses, and recognize that many functions have inverses that are not functions. In the second, students determine inverses of parent functions. They learn that the inverse of an exponential function is a logarithm. Reversing is emphasized once again as they learn how to convert exponential equations into logarithmic form, and vice versa. Students investigate the new family of logarithmic functions $f(x) = \log_b(x)$ for different values of b, test values on their calculators to determine the base the calculators work in, and learn to graph transformations of $f(x) = \log(x)$.

Progression of Content:
This chapter adds to students' lists of parent functions, which will continue to expand with the addition of polynomial functions in Unit 8 and trigonometric functions in Unit 9.

B. Unit Assignment(s):
Mathematics Practices used in Unit 5:

- Students will look for and make use of structure and construct viable arguments as they develop and justify strategies for undoing functions and as they investigate different bases for logarithms..
- Students will use appropriate tools strategically and look for and make use of structure when they graph inverses of functions and write their equations.
- Students will look for and make use of structure as they verify inverses using multiple representations, and attend to precision as they restrict the domain of a function to ensure that its inverse is also a function.
- Students will construct viable arguments and critique the reasoning of others and look for and make use of structure as they apply their knowledge of parent graphs and inverses to learn about logarithms.
- Students will look for and make use of structure and express regularity in repeated reasoning as they learn the definition of logarithm and calculate the values of logarithms.

- Students will construct viable arguments and critique the reasoning of others, use appropriate tools strategically, and look for and make use of structure as they investigate logarithms with different bases.

Sample Activities:
Guess My Number Game - Students are asked to guess the number the teacher is thinking of based on the order of operations applied to the number and what the mystery number has ultimately transformed into. Students may or may not write an equation, but you may want to encourage them to do so as it will help when they progress to working with functions and inverses. Making sure that the idea of reversing, or undoing, comes up in the discussion of the "Guess My Number" game. You undo each step, reversing the original Order of Operations.

Graph the Inverse Function - Students will be looking at strategies for creating graphs of inverse functions. The first two graphs have functions that they are capable of finding the equation of their inverse functions but the third function does not lend itself to be solved for the inverse function. Teams could make a mini-table of some coordinates from the graph and then use it to help make a mini-table for the inverse graph. Students will soon discover that the line $y = x$ is the line of symmetry.

Semester B

Unit 6: **Simulating Sampling Variability** *(approximately 12 days)*

STANDARDS
S-IC.1, S-IC.2, S-IC.4, S-IC.5, S-IC.6, S-MD.6+, S-MD.7+

A. This unit introduces students to techniques for computing complex probabilities through simulations. Students also begin working with inferential statistics and statistical hypothesis testing. Students will develop an understanding of counterintuitive probability problems by using area models or tree diagrams. Students learn how to use simulations to estimate complex probabilities. Students then investigate the concept of natural variation in samples and how that variation can be modeled and controlled through sample size. Students will use the concept of sample-to-sample variation from Unit 6.1 to perform informal hypothesis testing using margin of error in Unit 6.2. The section concludes with an introduction to statistical process control. Any system designed to detect rare events may be highly accurate but still have problems with false positives. In Unit 6.3, students will look at several such systems, such as HIV and drug tests, and decide whether the social cost of false positives is greater than the benefits of true positive results.

Progression of Content:
This unit provides an introduction to inferential statistics. Students will make statements about populations based on information obtained from a sample. They will study this topic more extensively if they take a formal course in statistics.

B. Unit Assignment(s):
Mathematics Practices used in Unit 6:

- Model with Mathematics as they simulate the probability of a newborn being a boy or girl; simulate the number of streaks they can expect in a random process; take a random sample of candies to understand margin of error; explore sample-to-sample variability by conducting a hypothesis test; and use simulations to determine if a manufactured part is within typical quality specifications.
- Attend to Precision as they evaluate the mean and margin of error from a data set, evaluate the results from their simulations, simulate the quality control process for a specific company.
- Use Appropriate Tools Strategically as they compare the effects of two treatments in an experiment, evaluate results of simulations, analyze decisions and strategies in situations that are counterintuitive.

Sample Activity:
AIDS in South Africa - Students will showcase their understanding of estimating sample-to-sample variability and conducting a hypothesis test. Given the claim of a drug manufacturing company, students will simulate 100 samples of 125 residents. They will determine the mean, margin of error, and determine if they can support the claim of the drug company. Students are asked if their margin of error is reasonable and then tell what must be done to make the margin of error smaller.

Unit 7: **Logarithms and Triangles** *(approximately 13 days)*

STANDARDS
F-LE.3, F-LE.4, F-LE.4.1, F-LE.4.3, A-SSE.2, F-BF.1, F-IF.7e, G-SRT.9+, G-SRT.10+, G-SRT.11+

A. In this unit, students return to their work with logarithms to develop tools they can use when solving application problems involving exponential equations. In the first half of this unit, students investigate the family y = log(mn) and discover the Power Property of Logarithms, which allows them to solve exponential equations by using logs to undo or rewrite the equation. Students generalize from number patterns to make conjectures about other properties of logarithms and then prove these properties. Furthermore, students develop and share strategies to write the equation of the exponential function with a given asymptote that passes through two given points. Then they use that equation to make predictions.

The remainder of this unit focuses on completing a tool kit for calculating missing parts of non-right triangles. Students identify the types of information needed to determine all of the missing sides and angles of a triangle. Through this exercise, students also identify triangles for which they do not yet have the tools to determine missing parts. Students notice that they *do* have

enough tools to calculate the measures and side lengths of right triangles. This leads to the question, *"What if the triangle is not a right triangle?"* Students then develop the Law of Sines and Law of Cosines so that they have a complete set of tools to determine the other missing parts of any triangle (when sufficient information is provided).

The unit concludes with students looking at different application problems using triangles and identifying which tools are most useful in each situation. In addition, students investigates the ambiguous case of triangles: SSA. This lesson is offered for accelerated classes or those that could benefit from a complete view of the relationships between the sides and angles of a triangle. Working through the problems of this lesson before you decide to use the lesson with your students is highly recommended.

Progression of Content:
The work with logarithms in this unit prepares students for future work in a pre-calculus course. Working with Law of Sines and Cosines and reviewing the use of right triangle trigonometry and special right triangles prepares students for working with the trigonometric family of functions in Unit 9.

B. Unit Assignment(s):
Mathematics Practices used in Unit 7:

- Students will look for and make use of structure and express regularity in repeated reasoning while they develop the Power Property of Logarithms, learn other properties of logs and how to rewrite equations with different bases.
- Students will make sense of problems and reason abstractly and quantitatively as they write the equation of an exponential function given two points and an asymptote.
- Students will make sense of problems and persevere in solving them, model with mathematics, and reason abstractly and quantitatively as they explore exponential functions with an asymptote other than $y = 0$ and apply logarithms to solve an exponential equation.
- Students will make sense of problems and persevere in solving them as they figure out what information they need to solve for parts of triangles. They will need to attend to precision as they communicate what they know and do not know.
- Students will look for and express regularity in repeated reasoning as they develop the ratios for the Law of Sines.
- Students will make sense of problems and persevere in solving them using the Law of Cosines.
- Students will attend to precision as they work with triangles involving the SSA relationship. They must also use appropriate tools strategically as they explore the ambiguous case of the Law of Sines.
- Students will reason abstractly and quantitatively as they make sense of problems and persevere in solving them. They will attend to precision as they solve the problems and communicate within their teams, labeling diagrams, attending to units, and calculating their answers accurately.

Sample Activities:
"The Case of the Cooling Corpse" - a problem in which students model the falling temperature of a corpse to establish time of death and solve a murder mystery. In order to solve the mystery, students will need to decide which information is relevant to solving the problem (e.g., body temperature, times listed on sign-in sheets, etc.) . Students will need to write and solve a system of exponential functions, with a horizontal asymptote representing the room temperature, the independent variable as time, and the dependent variable as the temperature of the body.

Solving Triangles - This activity consists of eight independent triangle problems (suggestion is to assign one problem to a group of 3-4 students) that will provide students with a chance to consolidate their understanding of the various tools and strategies they have developed so far to solve triangle problems. Some problems may be solved using the Law of Sines, Law of Cosines, or a combination of both. Students will present their assigned problem to the entire class and their process for solving the assigned problem.

Unit 8: **Polynomials** *(approximately 15 days)*

STANDARDS
A-APR.1, A-APR.2, A-APR.4, A-APR.6, A-APR.3, F-IF.4, F-IF.7c, N-CN.8+, N-CN.9+, A-SSE.2, A-CED.2, F-BF.1

A. In the first section, students will investigate the equation ↔ graph connections for polynomial functions. They will recognize that equations in factored form are much easier to sketch, and they will understand the relationship between the factors and the x-intercepts of the graph. Then, in the second section, they will develop an understanding of imaginary and complex numbers and recognize that polynomial functions can have complex roots. In the third and last section, they will learn to divide polynomials by a known factor to find other factors. This will allow them to determine complex and irrational roots of some cubic and quartic functions.

Progression of Content:
Students will build on their understanding of function families in Unit 9, where they study trigonometric functions and transform the graphs of sine and cosine functions. Students will use their algebra skills when they study rational expressions in Unit 11. Students will also use their algebra skills when they prove formulas for sums of series in Unit 10 and solve trigonometric identities in Unit 12.

B. Unit Assignment(s):
Mathematics Practices used in Unit 8:

- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they discuss factored form and describe the graphs of polynomials and their understanding of the stretch. Students will also look for and make use of structure as they draw graphs of polynomials.

- Students will look for and make use of structure as they continue their polynomial investigation. Students will also construct viable arguments and critique the reasoning of others as they consolidate their results on polynomials.
- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they develop their understanding of a stretch factor. Student will also model with mathematics as they develop an equation for the roller coaster problem first introduced in the first lesson of Unit 8.
- Students will look for and make use of structure as they use polynomial division to determine factors of polynomials. Students will also construct viable arguments and critique the reasoning of others as they develop their understanding of polynomial division.
- Students will look for and make use of structure as they use complex roots to write equations of quadratic functions and express regularity in repeated reasoning as they identify polynomial identities to help them factor. Students will also look for and express regularity in repeated reasoning as they identify patterns in the sums and products of complex roots.
- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others when they determine all roots of a polynomial with a degree greater than two and when they determine all roots of a polynomial with a degree greater than two.

Sample Activities:
Polynomial Function Investigation - Students are instructed to look for, label, and describe the x-intercepts and "bounces" (double roots, although students will probably not use this term), the y-intercept, the number of turns, and the behavior of graphs for very large and very small x-values. They should share and discuss all of their graphs and their observations within their teams. The discussion should lead to conjectures and the creation of several new equations to try. Students are coming up with methods for determining the x- and y-intercepts, predictions about the numbers of crossings of the x-axis, and ideas for determining a reasonable window or maximum and minimum approximations.

Game of Polydoku - By treating division as a puzzle and using the organizational device of an area model, students can use logical reasoning to reverse the multiplication process and figure out a missing factor. Once they have worked through the process several times, they should be able to set up and solve their own division problems. This method is as efficient as (if not more efficient than) polynomial "long division" and you can use it to develop synthetic division if that is part of your curriculum. This game introduces polynomial division by challenging students to reverse the process of polynomial multiplication.

Unit 9: **Trigonometric Functions** *(approximately 16 days)*

STANDARDS
F-TF.5, F-BF.1, F-IF.4, F-IF.7e, F-TF.2.1, F-TF.5, F-TF.2, F-BF.2.1, F-BF.3

A. In this chapter, students will extend their understanding of trigonometric ratios in right triangles to trigonometric functions. The unit circle is introduced as a representation of trigonometric relationships, and students explore the connections between the unit circle and graphs of trigonometric functions. They look at sine as the height, cosine as the base, and tangent as the slope of the hypotenuse of a right triangle within the unit circle. Students are often confused by the use of variables in trigonometric relationships. When they think of x as the horizontal coordinate in the unit circle, seeing the function y = sin(x) is confusing. For this reason, the notation y = sin(θ) appears through most of the first section. When investigating trigonometric functions whose periods are not 2π the transition is made to y = sin(x). In the second section, students investigate y = sin(x) and y = cos(x) as parent functions and explore their transformations. They develop understanding of the idea of period and its role in the general equation. By the end of the chapter, teams will be able to generate graphs from sinusoidal equations and vice versa.

Progression of Content:
In Unit 12, students will return to the study of trigonometry. They will solve trigonometric equations, learn reciprocal trigonometric functions, develop trigonometric identities, and further explore the connections between sine, cosine, and tangent.

B. Unit Assignment(s):
Mathematics Practices used in Unit 9:

- Students will model with mathematics as they determine how to create an equation to represent a periodic situation.
- Students will model measurement data with mathematics and reason abstractly and quantitatively as they validate their model. They will also look for and make use of structure as they create a sine graph to represent a situation.
- Students will look for and make use of structure and look for and express regularity in repeated reasoning as they make connections between different angles on the unit circle that have the same sine ratio.
- Students will use appropriate tools strategically as they find sine and cosine values. They will also look for and make use of structure and look for and express regularity in repeated reasoning as they make connections between the sine and cosine values of points on the unit circle and their x- and y-values on a coordinate graph.
- Students will use appropriate tools strategically, look for and make use of structure, and look for and express regularity in repeated reasoning as they apply the definition of a radian and learn how to convert between radian and degree measures.
- Students will use appropriate tools strategically, look for and make use of structure, and look for and express regularity in repeated reasoning as they complete key points on a unit circle using radian measures.
- Students will make sense of problems and persevere in solving them as they figure out how to create a graph of the tangent function. They will look for and make use of structure

and express regularity in repeated reasoning as they connect the tangent function to what they already know about the sine and cosine functions.

- Students will use appropriate tools strategically as they investigate transformations of trigonometric functions using technology. They will also look for and make use of structure and express regularity in repeated reasoning as they develop a general equation for the sine and cosine family of functions.
- Students will make sense of problems and persevere in solving them as they model a situation using a sine function. They will use appropriate tools strategically and look for and make use of structure as they identify the period of periodic functions and further investigate the general equation for sine functions.
- Students will use appropriate tools strategically, look for and make use of structure, and express regularity in repeated reasoning as they make graphs of sine functions and write equations from sine graphs.
- Students will model with mathematics and use appropriate tools strategically as they make connections between periodic graphs and their equations. Students will also look for and express regularity in repeated reasoning as they see that sine and cosine functions are horizontally shifted versions of each other.

Sample Activities:
Blood Drip Lab - Students either in their teams or as a class will conduct the lab with simulated blood dripping from an IV bag. This is a preview of transformations of sinusoidal functions, which students will explore in the next section. At that time, they will revisit this lesson's activity and write equations to model the curve that they create. They will investigate what are the different factors that play a role in how each sinusoidal graph differs from each other.

The Screamer Ferris Wheel - Students use a ferris wheel model to find the height in which a rider will need to either climb up or down from the ferris in the event of the ferris wheel halting. So by measuring the height of a car on the ferris wheel at different positions, students will be able to create the sine graph unknowingly.

Unit 10: **Series** *(approximately 19 days)*

STANDARDS
A-SSE.1a, A.SSE.2, A.SSE.4, A-APR.5+, A-APR.4

A. This unit provides an opportunity for students to use what they have learned during earlier units, and then extend their knowledge to new contexts. The development of formulas for sums of geometric and arithmetic series depends on the work with sequences students started in previous courses and further develops their skills with algebraic procedures. The development of the Binomial Theorem involves working with combinations, a topic from previous courses. The lesson on mathematical induction provides an introduction to this form of proof as well as practice with algebraic manipulation.

Progression of Content:
Using a graphical approach to develop a formula for the sum of an arithmetic series previews the use of the area of rectangles to calculate the area under curves in a later course. Summation notation and series will be developed further in precalculus and calculus.

B. Unit Assignment(s):
Mathematics Practices used in Unit 10:

- Students will make sense of problems and persevere in solving them as they determine how to calculate the sum of an arithmetic sequence, and they will look for and express regularity in repeated reasoning as they develop strategies that allow them to do this efficiently.
- Student will make sense of problems as they use geometric representations to represent arithmetic sequences and use them to calculate sums. They will also look for and express regularity in repeated reasoning as they begin to generalize their methods.
- Students will look for and make use of structure as they learn how to combine known series to form new ones. Additionally, they will look for and express regularity in repeated reasoning as they construct formulas for sums that have an unspecified number of terms.
- Student will look for and express regularity in repeated reasoning and attend to precision as they use summation notation to compute the sums of arithmetic sequences algebraically.
- Students will make sense of problems and persevere in solving them, and construct viable arguments and critique the reasoning of others as they explore proof by induction.
- Students will make sense of problems and persevere in solving them as they create a strategy for calculating the sums of geometric series. They will also reason abstractly and quantitatively as they solve problems using either sums of arithmetic series, geometric series, or both.
- Students will make sense of problems, model with mathematics, and look for and make use of structure as they use binomial probability models to represent and analyze situations.
- Students will look for and express regularity in repeated reasoning and look for and make use of structure as they describe patterns in Pascal's triangle and make connections between the patterns in the triangle and binomial expansions.
- Students will look for and express regularity in repeated reasoning to make sense of problems as they discover how the Binomial Theorem is related to the derivation of *e*.

Sample Activities:
Sum of an Arithmetic Series - Before getting to the general equation to find the sum of *k* terms in an arithmetic series, S(k)=t(1)+t(k)k2, students find the sum graphically. The visualization of forming a rectangle by stacking the first term and the last term of the series, and noticing that a rectangle with a base length of *k*/2 and a height equivalent to the first + last term is a way of finding the sum of the terms in the series.

Pascal's Triangle and the Binomial Theorem - During this activity, students connect two topics in mathematics that they may not think are related: counting combinations and equivalent algebraic expressions.

Unit 11: **Rational Expressions and Three-Variable Systems** *(approximately 12 days)*

STANDARDS
A-APR.7+, A-CED.2

A. In the first section of this chapter, students will focus on operations with rational expressions. Students did a function investigation in Unit 1 that previewed the investigation of rational expressions. Students learn a powerful method of simplifying rational expressions that uses properties of the number 1 and the properties of exponents. The last lessons in this chapter build upon and reinforce students' understanding of operations with rational numbers while developing procedures for operations with rational expressions. In the second section, students are introduced to the three-dimensional Cartesian coordinate system and are challenged with the task of graphing an equation with three variables. Students use hands-on graphing techniques and technology to help them visualize graphs of planes. In a previous course, students learned to solve a system of two linear equations in two variables, and they reviewed this topic in Chapter 3 of this text. At the end of Section 11.2, students extend these methods to develop a procedure for solving a system of three linear equations in three variables.

Progression of Content:
The remaining chapter requires students to use their algebra skills to solve trigonometric identities. The three-dimensional visualization in this chapter prepares students for visualizing intersections of planes with cones to form conic sections in future courses. In future courses, students may use matrices to solve systems of equations.

B. Unit Assignment(s):
Mathematics Practices used in Unit 11:

- Students will look for and make use of structure as well as look for and express regularity in repeated reasoning as they use the number 1 to understand rational expressions.
- Students will also look for and make use of structure as well as look for and express regularity in repeated reasoning as they connect multiplication and division of fractions to that of rational expressions.
- Students will look for and make use of structure as they make connections between adding and subtracting fractions and adding and subtracting rational expressions, and as they locate points in three-dimensional space. They will construct viable arguments and critique the reasoning of others as they justify their strategies.
- Students will continue to look for and make use of structure as well as look for and express regularity in repeated reasoning as they work with rational expressions. They will

construct viable arguments and critique the reasoning of others as they investigate the closure of rational expressions under operations.

- Students will look for and make use of structure when they graph on three-dimensional axes.
- Students will look for and make use of structure and use appropriate tools strategically when they solve a system of three equations with three variables algebraically and investigate the different ways three planes can intersect.
- Students will reason abstractly and quantitatively and look for and express regularity in repeated reasoning as they write the equation of a quadratic function by solving a system of three equations with three unknowns.

Sample Activities:
Giant One - Students are encouraged to rewrite rational expressions to create fractions that will reduce to one. The new expressions will be reduced to its simplest form. This strategy to rewrite will allow students to simplify rational expression after doing basic operations on the original expressions.

3-D Coordinate System - Students use cubes to build prisms in their three-dimensional system to help them visualize different points. Students will need cubes to build these prisms as well as isometric dot paper to represent their solutions. Using the dimensions of the prism, students can name the coordinate farthest from the origin on which the opposite corner is already lying on.

Unit 12: **Analytic Trigonometry** *(approximately 15 days)*

STANDARDS
F-IF.7e, F-TF.2.1, F-TF.9+

A. The intent of this chapter is to give students a strong exposure to analytical trigonometry that will prepare them to enter a pre-calculus or calculus course. The chapter centers on solving equations and asks students to think about the circumstances under which an equation is true. Section 12.1 focuses on equations that are sometimes true, giving students the tools to find all relevant solutions. Section 12.2 focuses on identities, that is, equations that are always true. Through the study of identities, students gain the understanding necessary to rewrite equations, which expands the range of equations they are able to solve.

Progression of Content:
By the end of this course, students will have completed trigonometric units which will prepare them for a fourth year in math, whether it be a trigonometric course or Precalculus.

B. Unit Assignment(s):
Mathematics Practices used in Unit 12:

- Students will construct viable arguments and critique the reasoning of others and attend to precision as they investigate trigonometric and other algebraic equations to determine under what conditions they are true, and as they investigate the Angle Sum and Difference Identities.
- Students will use appropriate tools strategically as they represent solutions in multiple ways. They will look for and make use of structure as they represent all of the solutions for trigonometric equations.
- Students will look for and make use of structure and attend to precision as they consider the inverses of trigonometric functions and their domains.
- Students construct viable arguments and critique the reasoning of others as well as attend to precision in their use of mathematical terms and notation and in their creation of graphs of the reciprocal trigonometric functions.
- Students will look for and make use of structure and attend to precision as they use graphs to discover trigonometric identities and apply the trigonometric identities to solve problems.

Sample Activities:
Carbon Copy to find inverses of Trigonometric Functions - Students will graph sine, cosine, and tangent functions on a resource page then use the "Carbon Copy" method to find the inverse graph of these three trigonometric functions. This is a method used in the activity mentioned in Unit 5: Graphing the Inverse Function Activity.The focus of this activity is for students recognize how the domain and range of these functions change. Students already know that the domain and range switch, but this is the first time that they see it in trigonometric functions.

Graphs of Reciprocal Trigonometric Functions - In this activity, students are introduced for the first time to the reciprocal trigonometric functions (secant, cosecant, and cotangent). For example, after graphing the sine function, students use the concept of reciprocals to graph y=1sinx to create the graph of the cosecant function. Using the new graph, student conduct a full investigation of this new function and make observations, including the fact that the x-intercepts of sine graph become vertical asymptotes for cosecant function. A similar process is done with the secant and cotangent functions.

Assignments, Student Engagement, and Assessments
Through the use of technology (including graphing calculators, Desmos, and etools embedded throughout the curriculum), whole class/pair/group discussions, and independent practice, students will deepen their understanding of the mathematical content standards covered in this course. Furthermore, each unit will have multiple investigative activities that will require students to synthesize the information from the current unit as well as previous units and will require them to use their problem solving skills. For each unit, students will be assigned daily classwork and daily homework. Group activities will be incorporated into classwork assignments. Students will often engage with fellow students in the investigative and modeling process. Teachers will encourage all students to participate and explore. Opting out of learning

will not be an option. While students are encouraged to construct their own viable arguments, they will also be encouraged to appraise those of others during discussion sessions.

Assessments

The instructional methods and strategies listed below support the delivery of this Integrated Mathematics I course with emphasis on group work, investigative activities, the Standards for Mathematical Practice (SMP) will be applied throughout the curriculum. SMP) will be applied throughout the curriculum. Students' mathematical skills and understanding will be assessed through a range of strategies, such as:

- **Individual Tests** that will allow the teacher to determine a student's ability to solve mathematical problems, level of skill mastery, and conceptual understanding of topics or ideas.
- **Team Tests** that will be used primarily as a formative assessment and an opportunity to assess the SMPs, which include problems designed to inspire in-depth conversations and collaboration around essential mathematics.
- **Participation Quizzes** that will allow the teacher to assess, and therefore support, the quality of the teams' cooperation, independent of mathematical content. In a Participation Quiz, the quality of the teamwork on any given task is documented and assessed directly by the teacher, rather than the mathematical content.
- **Student Presentations** that will allow students to exchange insights, use the language of mathematics, and deepen their understanding at the same time that they allow teachers to assess mathematical communication, justification, and making connections.
- **Class Observations** that will allow the teacher to assess, with varying degrees of formality, the quality of the discussion of mathematics in the interactions created as teams work together. Daily Assignments will vary giving students opportunities to practice what they've learned in class. This instructional approach allows students to look for and express regularity in repeated reasoning by practicing mathematical strategies learned in the classroom.
- **Independent Practice (Homework)** that will allow students the opportunity to enhance their learning and extend their practice. Nightly homework may be an extension of an investigation, more practice with similar scenarios, or practice with basic symbolic skills. Students will use appropriate tools strategically and attend to precision while extending their learning.
- **Math Portfolios** that will give students a chance to "show off" their learning, taking pride in their own perseverance, growth over time, and appropriate use of math tools, techniques and proficiency. Simultaneously, the teacher will be able to assess understanding and make instructional decisions accordingly, without the pressure of a test.
- **Investigative Activities** that will encourage students to ask questions about a complicated situation and apply mathematics in pursuit of a solution. In the process, students will make assumptions and approximations, understanding that revisions might be needed at a later time. Abstract and quantitative reasoning is applied in considering quantities and their relationships during problem solving.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Integrated Math III
Course Code:	3513DH, 3514DH
School(s) Course Offered:	Crescenta Valley High School, Hoover High School, Verdugo Academy
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated Mathematics II
Recommended Textbook:	*California Integrated Mathematics 3* Timothy D. Kanold, Edward B. Burger, Juli K. Dixon, Matthew R. Larson, Steven J. Leinwand Houghton Mifflin Harcourt 2015
Course Overview:	Integrated Mathematics III aims to apply and extend what students have learned in previous courses by focusing on finding connections between multiple representations of functions, transformations of different function families, finding zeros of polynomials and connecting them to graphs and equations of polynomials, modeling periodic phenomena with trigonometry, and understanding the role of randomness and the normal distribution in making statistical conclusions. On a daily basis, students in this course use problem-solving strategies, questioning, investigating, analyzing critically, gathering and constructing evidence, and communicating rigorous arguments justifying their

thinking. Under teacher guidance, students learn in collaboration with others while sharing information, expertise, and ideas.

The course is well balanced between procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (extension and transference). The lessons in the course meet all of the content standards, including the "plus" standards, of Appendix A of the *Common Core State Standards for Mathematics*. The course imbeds the CCSS Standards for Mathematical Practice as an integral part of the lessons in the course.

Key concepts addressed in this course are:

- Visualize, express, interpret and describe, and graph functions (and their inverses, in many cases). Given a graph, students will be able to represent the function with an equation, and vice-versa, and transform the graph, including the following function families: absolute value, exponential, linear, logarithmic, piecewise-defined, polynomial, quadratic, square root, trigonometric.
- Use of variables and functions to represent relationships given in tables, graphs, situations, and geometric diagrams, and recognize the connections among these multiple representations.
- Application of multiple algebraic representations to model and solve problems presented as real world situations or simulations.
- Solving linear or quadratic equations in one variable, systems of equations in two variables, and linear systems of equations in three or more variables.
- Use of algebra to rewrite complicated algebraic expressions and equations in more useful forms.
- Rewriting rational expressions and arithmetic operations on polynomials.
- The relationship between zeros and factors of polynomials.
- Operations with complex numbers, and solving quadratics with complex solutions.
- Applications of the Law of Sines and Law of Cosines.
- Modeling periodic phenomena with trigonometric functions.
- Calculating the sums of arithmetic and geometric series, including infinite geometric series.
- Concepts of randomness and bias in survey design and interpretation of the results.
- Use of a normal distribution to model outcomes and to make inferences as appropriate.
- Use of computers to simulate and determine complex probabilities.
- Use of margin of error and sample-to-sample variability to evaluate statistical decisions.
- Solving trigonometric equations and proving trigonometric identities.
- Understand logarithms and their inverse relationship with exponentials.
- Use logarithms to solve exponential equations.

Course Content:

Semester A

Unit 1: **Measurement and Modeling in Two and Three Dimensions** *(approximately 20 days)*

STANDARDS
G-GMD.4, G-GMD.5, G-MG.1

A. Students will learn about cross sections and solids of rotation. They will utilize formulas to calculate the surface area of prisms, cylinders, pyramids, cones, and spheres. Students will work with geometric probability and scale factor. They will explore the differences between Euclidean and spherical geometry.

Major Topics:
Cross sections and solids of rotation
Formulas for the surface area of a prism, cylinder, pyramid, cone and sphere
Scale factor
Calculating density
Modeling to meet constraints

B. Unit Assignment(s):
At the end of this unit, students will complete a Math in Careers task relating to a scale model of a sphere. Critical skills include finding a scale factor and applying knowledge of spherical geometry. Students will experience how a model maker uses mathematics on the job.

Mathematical Practices Used in Unit:

- MP.1 - Students will make sense of problems when they use multiple formulas to find the surface area and/or volume of composite solids.
- MP.2 - Students must reason abstractly to visualize the cross sections of solids. Students relate the properties of three-dimensional figures (faces, vertices, and intersections of planes) and their rotational symmetry to help identify cross sections of solids. Students will use their knowledge of surface area of spheres and scale to find actual distances on the globe.
- MP.4 - Students represent real-world problems with mathematical models when they find the density of real-life objects as the weight or mass per unit of volume, and extend that idea to density to population density, or the population of a region per unit area of the region.
- MP.8- Students will decompose solids into two-dimensional shapes for finding surface area and determine shortcuts (formulas) for finding surface area of prisms and cylinders. Students will apply their knowledge of two- and three- dimensional figures to describe the transformation of figures by scale factor *a.*

Unit 2: **Polynomial Functions, Expressions, and Equations** *(approximately 28 days)*

STANDARDS
F-IF.4, F-IF.4, A-APR.1, A-APR.2, A-APR.5, A-APR.6, A-SSE.2

A. Students will learn about transforming function graphs and inverses of functions. They will perform operations on polynomials. Student will expand their ability to solve equations by finding rational and complex solutions.

Major Topics:
Transforming function graphs and inverses of functions
Graphing cubic and polynomial functions
Operations with polynomials
Binomial theorem
Finding rational and complex solutions of polynomial equations

B. Unit Assignment(s):
After completing this unit, students will complete a performance task by evaluating and subtracting quadratic functions representing the labor force of the United States. Critical skills include evaluating polynomial functions and operations with polynomials.

Using data from the U.S. Census Bureau, the students will be provided with two functions for approximating the labor force, one for the total number of workers and one for the number of female workers. First, students will use the functions to calculate the two estimates for the number of workers. Next, students will work in pairs to write a polynomial function that models the number of male workers and will explain to another pair how they found their function. Finally, students will discuss, as a class, alternative strategies for determining the number of males without using the function they wrote.

Mathematical Practices Used in Unit:

- MP.1, MP.3 - Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they discuss factored form of a polynomial, describe the graphs of polynomials, and develop their understanding of polynomial division.
- MP.2, MP.7, MP.8 - Students will reason abstractly and quantitatively, look for and make use of structure, and look for and express regularity in repeated reasoning as they make connections between the transformations of quadratic functions and transformations of polynomial functions. Students will also understand the relationship between a function and its inverse.
- MP.7 - Students will also look for and make use of structure as they draw graphs of polynomials, and use polynomial division to determine factors of polynomials and how those factors relate to the zeros of the function.

Unit 3: **Rational Functions, Expressions and Equations** *(approximately 15 days)*

STANDARDS
F-IF.7d, A-APR.7, A-REI.2

A. Students will learn about graphing rational functions. They will perform operations on rational expressions. Students will graph and solve rational equations.

Major Topics:
Graphing simple and complex rational functions
Adding, subtracting, multiplying and dividing rational functions
Solving rational equations

B. Unit Assignment(s):
After finishing this unit, students will complete a Math in Careers task by writing, analyzing, and graphing a function representing the concentration of acid in a mixture. Critical skills include representing real-world situations using rational functions, determining domain and range, and interpreting asymptotes.

Students will write a rule for a function that represents a specific acid and water mixture. Students will determine a reasonable domain for their function and explain to a partner. They will graph the function labeling the axes with the quantities they represent and indicate the axis scales. With a partner, a student will analyze the function's rule to determine the vertical and horizontal asymptotes and determine their relevance or irrelevance.

Mathematical Practices Used in Unit:

- MP.7, MP.8 - Students will look for and make use of structure as well as look for and express regularity in repeated reasoning as they connect multiplication and division of fractions to that of rational expressions, and make connections between adding and subtracting fractions and adding and subtracting rational expressions.
- MP.7 - Look for and make use of structure as they graph rational functions with the parameters a, b, h, and k.
- MP.3 - Students will construct viable arguments as they solve rational equations graphically to find the zeros of the function, and algebraically by rewriting an equivalent polynomial equation to solve the original rational equation.

Unit 4: **Radical Functions, Expressions and Equations** *(approximately 15 days)*

STANDARDS
F-BF.4a, F-IF.7b, N.RN.1, A-REI.2

A. Students will learn about inverses of quadratic and cubic functions. They will graph square and cube root functions. Students will simplify and solve radical equations.

Major Topics:
Inverses of simple quadratic and cubic functions
Graphing square and cube root functions
Radical expressions and rational exponents
Simplifying radical expressions
Solving radical equations

B. Unit Assignment(s):
Upon finishing this unit, students will do a performance task in which they will take on the role of a nutritionist. Students will find a quadratic function that models BMI data. Critical skills include fitting a function to data, finding the appropriate domain and range, and finding the inverse of a function.

Given the median BMI measures for a group of boys, students will create a scatter plot for the data. They will find a quadratic regression model for the data and explain their model. Students will then work with a partner to determine the domain and its restrictions for both the data set and its inverse. Lastly, students will graph the inverse of the function and determine what it models.

Mathematical Practices Used in Unit:

- MP.1 - Students will make sense of problems and persevere in solving them as they use various strategies to solve radical equations, and to obtain extraneous solutions.
- MP.4 - Students will explore how a function and its inverse can both model a given real-world situation.
- MP.7 - Students will look for and make use of structure about how the various parameters, a, b, h, and k, affect the graph of a square-root and cubic function, in relation to a quadratic and cubic function respectively.

Semester B

Unit 5**: Exponential and Logarithmic Functions and Equations** *(approximately 35 days)*

STANDARDS
F-BF.2, F-BF.3, F-BF.5, A-SSE.4, F-LE.2, F-LE.4.1, F-LE.4.2, S-ID.6a

A. During this unit, students will learn about both exponential and logarithmic functions. They will expand their understanding exponential functions as they learn about growth and decay. This will be the first time students have worked with the base, e.

Major Topics:
Exponential growth and decay
Arithmetic and geometric sequences
Choosing among linear, quadratic, and exponential models
Defining, evaluating, and graphing logarithmic functions
Using properties to solve exponential equations

B. Unit Assignment(s):
After the completion of this unit, students will explore how a nuclear medicine technologist uses math on the job. The task involves writing and using a function that describes the decay of a radioactive substance. Critical skills include representing exponential decay, interpreting exponential functions, and finding the inverses of functions.

Students will write an exponential decay function for technetium-99m with a half-life of 6 hours as it is used to map circulatory system disorders. They will describe the domain, range, and the end behavior of the functions as time increases. Students will also write the inverse of the decay function. Finally, they will determine how long it takes until a specific amount of the technetium-99m remains in the body.

Mathematical Practices Used in Unit:

- MP.7- Students will look for and make use of structure when identifying patterns in arithmetic and geometric sequences.
- MP.3- Students will construct viable arguments as to whether a sequence is arithmetic or geometric.
- MP.4- Students will understand the relationship between graphs of exponential functions, tables, real-world applications, and formulas that model exponential functions.
- MP.7- Students will understand the difference in the structure of a logarithmic equation versus its inverse, an exponential equation.

Unit 6**: Trigonometric Functions** *(approximately 25 days)*

STANDARDS
G-STR.8, G-SRT.10, F-TF.1, F-TF.2, F-TF.5, F-TF.8, F-IF.7e

A. This unit builds on the introductory trigonometric function learning from CC Integrated Mathematics II. Students will solve real life problems using trigonometric functions and Pythagorean identities. They will also work with transformations of graphs of trigonometric functions.

Major Topics:
Defining trigonometric functions with the unit circle
Laws of sines and cosines
Evaluating trig functions
Angle rotation and radian measure
Transformations of the parent graphs of trigonometric functions

B. Unit Assignment(s):
At the end of this unit, students will complete a Math in Careers task by using models to represent the motion of a paddle wheel. Critical skills include graphing a trigonometric function, describing what its parameters mean for the real world situation, and using the function to make a prediction.

Students will graph a function for a riverboat paddle wheel with a given diameter and revolution rate that hangs a specific distance below the water line during an identified time interval. Students will describe the significance of the intercepts, the maximum and minimum values for the situation. They will also predict how revolutions it will take for a point on the wheel to have traveled one mile.

Mathematical Practices Used in Unit:

- MP.2 Students will be able to reason abstractly in order to understand the relationship between the unit circle and the graphs of the trigonometric functions.
- MP.5 Students will be able to determine when it is appropriate to model periodic phenomena with a sinusoidal function. Students will use their knowledge of the key features of a trigonometric function to help fit the function to the model.
- MP.8 Students will look for and express regularity in repeated reasoning when organizing their work to find the angle measures of a triangle. Students will reason whether the measures given produce one triangle, two triangles or no triangle by using the Law of Sines.

Unit 7: **Statistics and Decision Making** *(approximately 22 days)*

STANDARDS
S-IC.1, S-IC.2, S-IC.3, S-IC.4, S-IC.5, S-ID.4, S-MD.6, S-CP.4

A. In this unit students will learn about statistics and using them to make sound decisions. They will gather and display data and find specific data points.

Major Topics:
Gathering and displaying data
Shape, center, and spread
Data distributions

Confidence intervals and margins of error
Using probability in making and analyzing decisions

B. Unit Assignment(s):
After completing this unit, the students will perform a statistical hypothesis test. Critical skills include writing a null hypothesis, creating visual representations of data, and proving or disproving the null hypothesis.

Students will work as a pharmaceutical scientist would by testing whether a certain medication for raising glucose levels is more effective at higher doses. They will be given pre-generated test results for ten patients, five high level doses and five normal level doses. They will state their null hypothesis for the experiment. Then students will compare the results using box plots. Students will then explain why or why not they have enough evidence to reject the hypothesis.

Mathematical Practices Used in Unit:

- MP.3 Students will be able to analyze whether a study is a survey experiment or an observational study and will be able to critique the results accordingly.
- MP.2 Students will be able to calculate confidence intervals and margins of error and be able to understand that statistics can help predict outcomes.
- MP.5 Students will be able to use a graphing utility to normalize data.

Unit 8: **Equations of Circles and Parabolas** *(approximately 19 days)*

STANDARDS
G-C.2, G-C.3, G-C.5, G-GMD.1, G-GPE.1

A. In this unit, students will identify whether a quadratic equation in general form represents a circle by completing the square to get the equation in standard form.

Major Topics:
Changing general form of quadratic equations into standard form
Identify whether the quadratic equations produces a circle or a parabola

B. Unit Assignment(s):
After completing this unit, students will complete a Module Performance Task to determine if a helicopter with a range of 290 nautical miles is in a close enough range to rescue a sailboat off the coast of California. Critical skills includes plotting, on a coordinate plane, the location of LAX and SFO airports along with the location of the sailboat given the latitude and longitude coordinates. Students need to determine which airport should send the rescue helicopter through graphing the equation of the

circle circles. Students will justify their reasons and show the evidence in their work for how they came up with their answer.

Mathematical Practices Used in Unit:

- MP.3 Students will construct viable arguments and justify their conclusions when identifying whether a quadratic equation in general form is a circle or a parabola.
- MP.8 Students will use repeated reasoning and algebraic steps when completing the square to change a general form quadratic equation into standard form.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Integrated Math IIIB/Precalculus Accelerated
Course Code:	3517D, 3518D
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated II/IIIA Accelerated or Integrated II + (Summer) Integrated Math IIIA Accelerated
Recommended Textbook:	*Core Connections Integrated III* Judy Kysh, Evra Baldinger, Michael Kassarjian, Karen Wootton, et. al CPM Educational Program Second Edition, Version 5.0 *Precalculus* Josea Eggink, Samantha Falkner, Emily Kaffel, Mark Ray, Jeanne Villeneuve, Karen Wooton, Erin Yao CPM Educational Program Third Edition

Course Overview: Integrated Mathematics IIIB/Precalculus Accelerated is part two of a two-part compacted math series. Following Integrated Mathematics II/IIIA Accelerated, this course provides students with instruction in the second half of the content of the Integrated Math III and all of the course content for Precalculus. This compression is designed as the single point of acceleration at the high school level as recommended by the California Mathematics Framework. This course is aligned to the California Common Core State standards for high school mathematics and supports the Standards for Mathematical Practice. With this course, students will develop a deep conceptual understanding of the mathematical relationships and concepts needed to succeed in higher level math courses.

In addition to covering the second half of Integrated III standards, this course meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking.

The course is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson. With the emergence of new technology, many lessons have moved beyond a traditional handheld device and are written with Desmos eTools as an integral component. The curriculum contains several key labs and hands-on activities to introduce and connect concepts, with an emphasis on modeling.

A focus on algebra is woven throughout the course. Students investigate equivalent expressions and practice setting up word problems right from the start. Students use algebra to manipulate inverse, composite, and piecewise-defined functions as well as investigate characteristics of functions and transformations of functions. Students continue rewriting expressions, solving complicated equations and systems, and use algebra to solve word problems. Algebraic manipulation is practiced throughout the rest of the course as students work with limits, rates of change, trigonometric expressions, complex numbers, series, conic sections, and area under the curve.

Careful consideration was given to the sequencing of the concepts in the course to allow for mastery over time while meeting the content standards of a 4th year course with focus on the 4th year math standards: algebra, functions, trigonometry, complex numbers, conic sections, probability, vectors, and matrices.

In addition to the second half of Integrated III standards, this courses covers the same material as Precalculus Honors, by adding and adds rates of change, limits and area under the curve to the standard Precalculus course.

Course Content:

Semester A

Unit 5: Inverses and Logarithms *(approximately 11 days)*

STANDARDS
F-BF.3, F-BF-4, F-BF.4a, F-LE.4, F-LE.4.2, I-IF.7e

A. Reversing is an important theme in the early part of this chapter. The first section introduces the concept of inverse relations. Students learn that reversing, or working backward to undo the action of a function, can create a new function. They explore multiple representations of functions and their inverses, and recognize that many functions have inverses that are not functions. In the second, students determine inverses of parent functions. They learn that the inverse of an exponential function is a logarithm. Reversing is emphasized once again as they learn how to convert exponential equations into logarithmic form, and vice versa. Students investigate the new family of logarithmic functions $f(x) = \log_b(x)$ for different values of b, test values on their calculators to determine the base the calculators work in, and learn to graph transformations of $f(x) = \log(x)$.

Progression of Content:
This chapter adds to students' lists of parent functions, which will continue to expand with the addition of polynomial functions in Unit 8 and trigonometric functions in Unit 9.

B. Unit Assignment(s):
Mathematics Practices Used in Unit 5:

- Students will look for and make use of structure and construct viable arguments as they develop and justify strategies for undoing functions and as they investigate different bases for logarithms..

- Students will use appropriate tools strategically and look for and make use of structure when they graph inverses of functions and write their equations.
- Students will look for and make use of structure as they verify inverses using multiple representations, and attend to precision as they restrict the domain of a function to ensure that its inverse is also a function.
- Students will construct viable arguments and critique the reasoning of others and look for and make use of structure as they apply their knowledge of parent graphs and inverses to learn about logarithms.
- Students will look for and make use of structure and express regularity in repeated reasoning as they learn the definition of logarithm and calculate the values of logarithms.
- Students will construct viable arguments and critique the reasoning of others, use appropriate tools strategically, and look for and make use of structure as they investigate logarithms with different bases.

Sample Activities:
Guess My Number Game - Students are asked to guess the number the teacher is thinking of based on the order of operations applied to the number and what the mystery number has ultimately transformed into. Students may or may not write an equation, but you may want to encourage them to do so as it will help when they progress to working with functions and inverses. Making sure that the idea of reversing, or undoing, comes up in the discussion of the "Guess My Number" game. You undo each step, reversing the original Order of Operations.

Graph the Inverse Function - Students will be looking at strategies for creating graphs of inverse functions. The first two graphs have functions that they are capable of finding the equation of their inverse functions but the third function does not lend itself to be solved for the inverse function. Teams could make a mini-table of some coordinates from the graph and then use it to help make a mini-table for the inverse graph. Students will soon discover that the line $y = x$ is the line of symmetry.

Unit 7: Logarithms and Triangles *(approximately 13 days)*

STANDARDS
F-LE.3, F-LE.4, F-LE.4.1, F-LE.4.3, A-SSE.2, F-BF.1, F-IF.7e, G-SRT.9+, G-SRT.10+, G-SRT.11+

A. In this unit, students return to their work with logarithms to develop tools they can use when solving application problems involving exponential equations. In the first half of this unit, students investigate the family $y = \log(m^n)$ and discover the Power Property of Logarithms, which allows them to solve exponential equations by using logs to undo or rewrite the equation. Students generalize from number patterns to make conjectures about other properties of logarithms and then prove these properties. Furthermore, students develop and share strategies to write the equation of the exponential function

with a given asymptote that passes through two given points. Then they use that equation to make predictions.

The remainder of this unit focuses on completing a tool kit for calculating missing parts of non-right triangles. Students identify the types of information needed to determine all of the missing sides and angles of a triangle. Through this exercise, students also identify triangles for which they do not yet have the tools to determine missing parts. Students notice that they *do* have enough tools to calculate the measures and side lengths of right triangles. This leads to the question, "*What if the triangle is not a right triangle?"* Students then develop the Law of Sines and Law of Cosines so that they have a complete set of tools to determine the other missing parts of any triangle (when sufficient information is provided).

The unit concludes with students looking at different application problems using triangles and identifying which tools are most useful in each situation. In addition, students investigates the ambiguous case of triangles: SSA. This lesson is offered for accelerated classes or those that could benefit from a complete view of the relationships between the sides and angles of a triangle. Working through the problems of this lesson before you decide to use the lesson with your students is highly recommended.

Progression of Content:
The work with logarithms in this unit prepares students for future work in a pre-calculus course. Working with Law of Sines and Cosines and reviewing the use of right triangle trigonometry and special right triangles prepares students for working with the trigonometric family of functions in Unit 9.

B. Unit Assignment(s):

Mathematics Practices Used in Unit 7:

- Students will look for and make use of structure and express regularity in repeated reasoning while they develop the Power Property of Logarithms, learn other properties of logs and how to rewrite equations with different bases.
- Students will make sense of problems and reason abstractly and quantitatively as they write the equation of an exponential function given two points and an asymptote.
- Students will make sense of problems and persevere in solving them, model with mathematics, and reason abstractly and quantitatively as they explore exponential functions with an asymptote other than $y = 0$ and apply logarithms to solve an exponential equation.
- Students will make sense of problems and persevere in solving them as they figure out what information they need to solve for parts of triangles. They will need to attend to precision as they communicate what they know and do not know.
- Students will look for and express regularity in repeated reasoning as they develop the ratios for the Law of Sines.

- Students will make sense of problems and persevere in solving them using the Law of Cosines.
- Students will attend to precision as they work with triangles involving the SSA relationship. They must also use appropriate tools strategically as they explore the ambiguous case of the Law of Sines.
- Students will reason abstractly and quantitatively as they make sense of problems and persevere in solving them. They will attend to precision as they solve the problems and communicate within their teams, labeling diagrams, attending to units, and calculating their answers accurately.

Sample Activities:
"The Case of the Cooling Corpse" - a problem in which students model the falling temperature of a corpse to establish time of death and solve a murder mystery. In order to solve the mystery, students will need to decide which information is relevant to solving the problem (e.g., body temperature, times listed on sign-in sheets, etc.) . Students will need to write and solve a system of exponential functions, with a horizontal asymptote representing the room temperature, the independent variable as time, and the dependent variable as the temperature of the body.

Solving Triangles - This activity consists of eight independent triangle problems (suggestion is to assign one problem to a group of 3-4 students) that will provide students with a chance to consolidate their understanding of the various tools and strategies they have developed so far to solve triangle problems. Some problems may be solved using the Law of Sines, Law of Cosines, or a combination of both. Students will present their assigned problem to the entire class and their process for solving the assigned problem.

Unit 8: Polynomials *(approximately 15 days)*

STANDARDS
A-APR.1, A-APR.2, A-APR.4, A-APR.6, A-APR.3, F-IF.4, F-IF.7c, N-CN.8+, N-CN.9+, A-SSE.2, A-CED.2, F-BF.1

A. In the first section, students will investigate the equation ↔ graph connections for polynomial functions. They will recognize that equations in factored form are much easier to sketch, and they will understand the relationship between the factors and the *x*-intercepts of the graph. Then, in the second section, they will develop an understanding of imaginary and complex numbers and recognize that polynomial functions can have complex roots. In the third and last section, they will learn to divide polynomials by a known factor to find other factors. This will allow them to determine complex and irrational roots of some cubic and quartic functions.

Progression of Content:
Students will build on their understanding of function families in Unit 9, where they study trigonometric functions and transform the graphs of sine and cosine functions. Students will use

their algebra skills when they study rational expressions in Unit 11. Students will also use their algebra skills when they prove formulas for sums of series in Unit 10 and solve trigonometric identities in Unit 12.

B. Unit Assignment(s):

Mathematics Practices Used in Unit 8:

- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they discuss factored form and describe the graphs of polynomials and their understanding of the stretch. Students will also look for and make use of structure as they draw graphs of polynomials.
- Students will look for and make use of structure as they continue their polynomial investigation. Students will also construct viable arguments and critique the reasoning of others as they consolidate their results on polynomials.
- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they develop their understanding of a stretch factor. Student will also model with mathematics as they develop an equation for the roller coaster problem first introduced in the first lesson of Unit 8.
- Students will look for and make use of structure as they use polynomial division to determine factors of polynomials. Students will also construct viable arguments and critique the reasoning of others as they develop their understanding of polynomial division.
- Students will look for and make use of structure as they use complex roots to write equations of quadratic functions and express regularity in repeated reasoning as they identify polynomial identities to help them factor. Students will also look for and express regularity in repeated reasoning as they identify patterns in the sums and products of complex roots.
- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others when they determine all roots of a polynomial with a degree greater than two and when they determine all roots of a polynomial with a degree greater than two.

Sample Activities:

Polynomial Function Investigation - Students are instructed to look for, label, and describe the x-intercepts and "bounces" (double roots, although students will probably not use this term), the y-intercept, the number of turns, and the behavior of graphs for very large and very small x-values. They should share and discuss all of their graphs and their observations within their teams. The discussion should lead to conjectures and the creation of several new equations to try. Students are coming up with methods for determining the x- and y-intercepts, predictions about the numbers of crossings of the x-axis, and ideas for determining a reasonable window or maximum and minimum approximations.

Game of Polydoku - By treating division as a puzzle and using the organizational device of an area model, students can use logical reasoning to reverse the multiplication process and figure out a missing factor. Once they have worked through the process several times, they should be able to set up and solve their own division problems. This method is as efficient as (if not more efficient than) polynomial "long division" and you can use it to develop synthetic division if that is part of your curriculum. This game introduces polynomial division by challenging students to reverse the process of polynomial multiplication.

Unit 11: Rational Expressions and Three-Variable Systems *(approximately 6 days)*

STANDARDS
A-APR.7+

A. In this chapter, students will focus on operations with rational expressions. Students did a function investigation in Unit 1 that previewed the investigation of rational expressions. Students learn a powerful method of simplifying rational expressions that uses properties of the number 1 and the properties of exponents. In a previous course, students learned to solve a system of two linear equations in two variables, and they reviewed this topic in Chapter 3 of this text.

Progression of Content:
The remaining chapter requires students to use their algebra skills to solve trigonometric identities. In future courses, students may use matrices to solve systems of equations.

B. Unit Assignment(s):
Mathematics Practices used in Unit 11:

- Students will look for and make use of structure as well as look for and express regularity in repeated reasoning as they use the number 1 to understand rational expressions.
- Students will also look for and make use of structure as well as look for and express regularity in repeated reasoning as they connect multiplication and division of fractions to that of rational expressions.
- Students will look for and make use of structure as they make connections between adding and subtracting fractions and adding and subtracting rational expressions, and as they locate points in three-dimensional space. They will construct viable arguments and critique the reasoning of others as they justify their strategies.
- Students will continue to look for and make use of structure as well as look for and express regularity in repeated reasoning as they work with rational expressions. They will construct viable arguments and critique the reasoning of others as they investigate the closure of rational expressions under operations.
- Students will reason abstractly and quantitatively and look for and express regularity in repeated reasoning as they write the equation of a quadratic function by solving a system of three equations with three unknowns.

Sample Activity:
Giant One - Students are encouraged to rewrite rational expressions to create fractions that will reduce to one. The new expressions will be reduced to its simplest form. This strategy to rewrite will allow students to simplify rational expression after doing basic operations on the original expressions.

Unit 1: Preparing for Your Journey *(approximately 15 days)*

STANDARDS
F.if.4, F.IF.5, F.BF.1, A.CED.1, A.CED.2, F.IF.5, A.SSE.2, A.APR.6, F.BF.1c, F.BF.4, F.IF.7b

A. This unit is designed to accomplish several objectives:
- Introduce students to some of the main concepts that are part of this course.
- Introduce students to the modeling cycle.
- Have students work with functions, including inverse, composite, and piecewise-defined functions.
- Introduce students to radians and the unit circle.

The opening of this unit establishes a starting point for many of the concepts in this course. Interpreting functions and their graphs will be used extensively in the modeling process throughout the course. Solving word problems as well as algebraic manipulation are skills that are necessary throughout the course.

Progression of Content:
Students are introduced to radians and the unit circle early in the course to facilitate work with trigonometric functions in later units. Students review the inverse functions from a previous course. Understanding domain restrictions will be necessary when students learn about the graphs of the inverse trigonometric functions contained in Unit 2 and Unit 8. After reviewing inverse functions, students will investigate composite functions and use them to algebraically determine if two given functions are inverses of each other. Lastly, students define a radian and use radians to measure angles in the unit circle. This is the start of using the unit circle, which trigonometry will be applied to throughout the course. The last lesson in this section examines angular motion vs. linear motion.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 1:
- Students will model with mathematics, attend to precision, look for and make use of structure as they collect data from the Spring Problem
- Students will make sense of problems and persevere in solving them, construct viable arguments and critique the reasoning of others, look for and make use of structure as they work to find the inverse of functions graphically, on a table, and a rule

Sample Activities:
The Spring Problem - Students engage with a notice and wonder through this activity as they conduct a lab using a spring with a weight attached at the end. In order to gather data from this activity, students video record the motion of the spring and weight in order to make a table and graph the results. Finally, students use the their model to make various predictions of the position of the wight at different times.

The Inverse of Function - Students will review how to write an inverse function by "undoing" and learn how to algebraically verify that functions are inverses. Students will see the inverse of a function graphically, on a table, and through its rule.

Unit 2: Functions and Trigonometry *(approximately 14 days)*

STANDARDS
F.IF.4, F.IF.7, F.BF.3, F.TF.3, F.TF.4, F.IF.7e, F.TF.2, A.REI.10, F.TF.6

A. This unit is designed to accomplish several objectives:
- Describe graphs as increasing/decreasing, concave up/concave down, and state the location(s) of maxima and minima.
- Identify graphs of functions as even, odd, or neither. Or, given the equation of a function, algebraically show that the function is even, odd, or neither.
- Develop fluency with angles and coordinates in the unit circle.
- Generate the parent graphs for sine and cosine and use them in a variety of transformations.
- Generate the parent graphs for inverse sine, inverse cosine, tangent, and inverse tangent.
- Solve basic trigonometric equations over specified domains.

In the first section of this unit, students will review attributes used to describe functions. Concavity will be introduced and students will use algebra to show that functions are even, odd, or neither. Then transformations of functions will be investigated. Again, much of this will be review from a previous course, but will now include horizontal stretches.

In Unit 1, students were introduced to radians and the unit circle. They have practiced a number of problems to reinforce key angle measurements and have worked with special triangles to develop ratios for 45º-45º-90º and 30º-60º-90º triangles. Now they will use these ideas to generate the key coordinates in the unit circle and develop the graphs of sine and cosine.
The second section is devoted to the development of sine and cosine from the standpoint of the unit circle. Students first locate the coordinates for the special angles they used in Unit 1. They then see that the sine ratio corresponds to the y-coordinate and the cosine ratio corresponds to the x-coordinate. Using these values, students develop the Pythagorean Identity. From here, students will graph $y = \sin(q)$ and $y = \cos(q)$ using the unit circle. The section continues with transformations of the graphs of sine and cosine.

In the last section, students begin by solving trigonometric equations. Here students will see that these equations can have multiple, and even an infinite number of, solutions. They will use graphs and the unit circle to generate the solutions to these equations. Students will then use $y = \sin^{-1}(x)$ and $y = \cos^{-1}(x)$ to solve for angles which are not the special angles in the unit circle. Finally, students generate the graphs of inverse sine, inverse cosine, tangent, and inverse tangent.

Progression of Content:
In this unit, students work with transformations of sine and cosine and applied these transformations to a few applications. Then in Unit 8, students extend their work with trigonometric functions to more complex situations; model situations with sinusoidal functions that have both a horizontal shift and a period other than 2π; graph and apply the reciprocal trigonometric functions; develop other trigonometric tools for simplifying expressions using formulas involving sums of angles.

B. Unit Assignment(s):
Mathematical Practices used in Unit 2:

- Look for and make use of structure, reason abstractly and quantitatively.
- Use appropriate tools strategically, look for and make use of structure, look for and express regularity in repeated reasoning.
- Construct viable arguments and critique the reasoning of others, look for and make use of structure, look for and express regularity in repeated reasoning.
- Use appropriate tools strategically, attend to precision.
- Make sense of problems and persevere in solving them, use appropriate tools strategically, attend to precision, look for and make use of structure.

Sample Activities:
The Unit Circle - Students determine the coordinates of the intersection of the terminal side of a special angle with the unit circle. Students will cut out two special right triangles from a resource page. Sides of the special triangles will be labeled using the exact values on both sides of the paper. This will ensure that the labels are shown when the triangles are flipped over. By placing each of the special right triangles on the x-axis, students will be able to find the coordinates of each of the special angles and repeat the process in all four quadrants to complete the unit circle.

Solving Trigonometric Equations - To solve an equation such as sin x =12, students are directed to draw a unit circle and also graph y = 12, which is a horizontal line. The intersections of the unit circle and the horizontal line will show students the solutions as well as number of solutions. By treating this problem as a system of equations, students are made aware of the connections the solutions are graphically and algebraically. In the same problem, students are asked how many more solutions there could be if we were allowed to continue to revolve around the circle. Eventually the next time students come across this type of problem, they will know to convert the unit circle into a sinusoidal graph and will see the horizontal line having multiple intersections with the sinusoidal graph to help them find all solutions.

Semester B

Unit 3: Algebra and Area Under the Curve *(approximately 10 days)*

STANDARDS
A.APR.6, A.APR.7, A.SSE.2, A.REI.7, A.REI.11, F.BF.1, A.CED.1

A. In Unit 3, students begin by practicing and strengthening their algebraic manipulation skills as they continue to write equivalent rational expressions and complex fractions. Students learn how substitution can help solve equations and systems of equations. Students then finish up this unit by solving a series of word problems using their algebra skills.

Another focus of this unit is approximating the area under a curve using summation notation. This concept is one of the major themes of calculus. The goal is to understand what area under a curve can represent and how to approximate it using rectangles.

Progression of Content:
Area under a curve is one of the main ideas in calculus. In this unit, students will be taught background information that will provide a deeper understanding of integration in calculus. The goal in this section is for students to understand the meaning of area under a curve.

B. Unit Assignment(s):
Mathematical Practices used in Unit 3:

- Students will make sense of problems and persevere in solving them, look for and make use of structure, construct viable arguments and critique the reasoning of others as they add, subtract, multiply, and divide rational expressions.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, reason abstractly and quantitatively as they calculate sums by expanding sigma notation as well as write finite arithmetic series in sigma notation.

Sample Activities
Growth Mindset (Jo Boaler) - In the first lesson of this unit, teachers are encouraged and given the tools to discuss the concepts of the importance of everyone, especially students, learning from their mistakes through error analysis and dendrite growth.

Unit 4: Polynomial and Rational Functions *(approximately 10 days)*

STANDARDS
F.IF.7c, A.APR.3, F.IF.4, N.CN.8, N.CN.9, A.APR.6, F.IF.7d, A.CED.1, A.CED.2

A. In this unit, students will apply their knowledge of families of functions to include polynomial and rational functions. Students will investigate the equation ↔ graph connection for these two families of functions, and learn to describe the end behavior of a function. In the first section, students will learn to graph polynomial functions from the factored forms or their equations.

Students will then work backwards, using graphs to write equations in factored form. Finally, students will learn how to identify all of the roots of a polynomial. Second section begins with a new method for rewriting equations of rational functions is introduced in this section. Students will practice graphing transformations of rational functions. Then students will investigate rational functions that have slant asymptotes and holes.

Finally, students will extend your knowledge of rational functions to graph reciprocal functions. In the last section of the chapter, students will apply what students have learned to solve polynomials and rational equations and inequalities. Finally, students will apply their knowledge of polynomial and rational functions to model and analyze everyday situations.

Progression of Content:
In calculus, polynomials are used to approximate complicated functions because they "behave nicely" and are easy to work with.

B. Unit Assignment(s):
Mathematical Practices used in Unit 4:

- Students will look for and make use of structure, construct viable arguments and critique the reasoning of others as they graph polynomial functions from equations given in factored form.
- Students will look for and make use of structure as they rewrite rational expressions to transform functions in the form $g(x) = \frac{ax+b}{x-c}$ into transformations of $y = \frac{1}{x-h} + k$.
- Students will look for and make use of structure, construct viable arguments and critique the reasoning of others as they solve polynomial and rational inequalities.

Sample Activities
Polynomial Function Investigation - Students will investigate the graphs of polynomial functions in factored form. Use different numbers of factors with different values of the parameters will show how it will change the graph. Sample of an equation in which students need to change the parameters would is as follows: n(x)=x-a(x-b)(x-c) in which a, b, and c will be different values. Students will have a chance to compare their graphs with their teammates to see the behavior of different types of equations without having to do all of them themselves.

Unit 5: Exponentials and Logarithms *(approximately 10 days)*

STANDARDS
A.CED.2, F.IF.7e, F.LE.2, F.BF.5, F.LE.4

A. The start of this unit focuses on exponential functions. Students will apply what they already know about exponential functions to everyday situations. Students will then realize that sometimes two different transformations give the same result, mainly that every exponential function with a horizontal shift is equivalent to a vertical stretch. This shows graphically, as well as algebraically, that every function of the form $y = a(b^{x-h}) + k$ is equivalent to $y = A(b^x) + k$. Furthermore, students will learn about the number e.

In the second half of this unit, students will review, use, and prove the properties of logarithms, each of which corresponds to a property of exponents. Students will also continue solving equations and simplifying expressions that involve logarithms and exponents. This unit is culminated through graphing the family of logarithmic functions and solving application problems.

Progression of Content:
This unit on exponential and logarithmic functions culminates students' engagement in this 4th year course.

B. Unit Assignment(s):
Mathematical Practices used in Unit 5:

- Students will make sense of problems and persevere in solving them, reason abstractly and quantitatively, model with mathematics, look for and make use of structure as they use exponential functions to model everyday situations
- Students will look for and make use of structure as they understand that for exponential functions, a horizontal shift can be equivalently written as a vertical stretch.
- Students will look for and make use of structure, use appropriate tools strategically, look for and express regularity in repeated reasoning as they practice converting between exponential and logarithmic equations, and investigate the basic properties of logarithms, including natural logarithms.

Sample Activities
The number *e* - In this activity, students explore what occurs when1 cm2of bacteria reproduces at 100% rate every hour, every minute, every second, and finally every millisecond for one day. A follow up question to this activity is, "What happens to the bacteria if it reproduces *continuously*?" Students will recognize that the base of their exponential model is getting closer and closer to the number *e* and the continuous compound formula A(t)=Pert.

Proving the Logarithmic Properties Card Sort:
In this activity, students prove the Product Property of Logarithms using a card sort. Each team obtains one set of cards. Students arrange the cards in the center of their team's workspace so that everyone can participate. Students then arrange the cards in a logical manner and provide justification for each part of their proof. Justifications can be written on sticky notes or blank cards so that they are easily moved as well. The teacher verifies that each team has the correct proof before allowing them to move on. Students prove the Quotient and Power Properties in a similar format.

Unit 6: Triangles and Vectors *(approximately 9 days)*

STANDARDS
G.SRT.9, G.SRT.10, G.SRT.11, N.VM.1, N.VM.2, N.VM.4, N.VM.5, N.VM.3

A. Two useful tools for solving situational problems are triangles and vectors. Many everyday situations involve triangles, so students will need to be able to solve any triangle with minimal given information. In first section, students will develop and use the Law of Sines and the Law of Cosines to solve non-right triangles. Students will learn to solve triangles when the given information does not create one unique triangle. In the second section, students will learn how to use vectors to describe motion; complete vector operations both graphically and algebraically; apply your knowledge of vectors to solve everyday problems.

Progression of Content:
Students are reintroduced to Law of Sines and Law of Cosines and their applications. But this will most likely be the last time students see a formal lesson on these topics. As for the lessons on vector, since this is the first introduction to the topic, students who pursue higher math and science course will encounter them again.

B. Unit Assignment(s):
Mathematical Practices used in Unit 6:

- Students will look for and make use of structure as they prove, understand, and apply the Law of Sines and Law of Cosines. They will also derive the formula $A = 1/2ab\sin(C)$ for the area of a triangle.
- Students will look for and make use of structure, attend to precision, use appropriate tools strategically as they are introduced to vectors and vector notation. They will determine magnitude, direction, and/or components of a vector.
- Students will make sense of problems and persevere in solving them, attend to precision, reason abstractly and quantitatively, model with mathematics, use appropriate tools strategically as they use vectors in real world applications.

Sample Activity:
Vector Line Dance - The Vector Line Dance has students perform a series of moves in the form of a line dance. The idea is that all of the students are doing the same movements but from different starting positions. The starting position does not matter when working with vectors. This activity is "self correcting" in that students should notice if they make a mistake in their direction or distance, since students should move in unison (similar to line dancing). Once students have completed the activity, the class can discuss the idea of everyone making the same motion (steps and direction), but from different positions. This develops the notion that a vector has a direction and length (magnitude).

Unit 7: Limits and Rates *(approximately 12 days)*

STANDARDS
Preparation for Calculus (Addition for Precalculus Honors)

A. In mathematics, the concept of a limit can be used to describe the behavior of a function as the independent variable approaches a particular value, or as it becomes arbitrarily large. In the first half of this unit, students will explore how functions behave as x approaches a particular value or goes to infinity. Students will also look at limits from several perspectives including geometry, graphs, tables, and algebra. Students will then learn about one-sided limits and evaluate limits of many functions including rational and piecewise-defined functions. Students will use limits to define continuity.

In the second half of this unit, students will investigate rates of change as they occur in everyday situations and through multiple representations. Often, the most interesting thing about the values in a situation is not the values themselves, but how those values are changing. Is your car speeding up or slowing down? Is the room getting hotter or colder? Furthermore, students will look at the slopes of secant and tangent lines. At the end of this unit, students will use what they have learned about limits to define instantaneous rate of change.

Progression of Content:
Students develop intuitive notions of limits during this unit and refine these ideas in Unit 13. The main focus in this unit is for students to begin to develop the definition of a derivative. The final goal, in Unit 13, is for students to understand what a derivative actually is and what it tells them about a function and its graph.

B. Unit Assignment(s):
Mathematical Practices used in Unit 7:

- Students will use appropriate tools strategically as they evaluate limits geometrically, graphically, on a table, and understand the necessary conditions for a limit to exist.

- Students will make sense of problems and persevere in solving them as they work with limits of functions such asf(x)=sin(x)x.
- Students will look fo and make use of structure as they calculate average rates of change by calculating the slope of the secant line between two data points.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning as they use the limit as $h \to 0$ for the average rate of change to calculate the instantaneous rate of change.

Sample Activity:
Folding Angles - This activity is intended to provide students a tangible example of limits during an engaging activity. In this activity, every student in a group chooses a different acute angle, marks it on their receipt tape, then bisects the supplementary obtuse angle adjacent to their initial angle. By repeating the process, students discover that repeated folds in a given pattern lead to angles ever closer to 60º.

Unit 8: Extending Periodic Functions *(approximately 12 days)*

STANDARDS
F.BF.3, F.TF.7, A.CED.2, F.TF.9, F.TF.10

A. In Unit 2, students worked with transformations of sine and cosine and applied these transformations to a few applications. This unit extends their work with trigonometric functions to more complex situations. Students will model situations with sinusoidal functions that have both a horizontal shift and a period other than 2π. Students will graph and apply the reciprocal trigonometric functions. You will also develop other trigonometric tools for simplifying expressions using formulas involving sums of angles.

Progression of Content:
In Calculus, students will be using trigonometric functions to find derivatives and find integrals.

B. Unit Assignment(s):
Mathematical Practices used in Unit 8:

- Students will look for and make use of structure as they combine a horizontal stretch and shift of the same trigonometric function and set up a modeling problem.
- Students will model with mathematics as they generate trigonometric models for real-world applications.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, use appropriate tools strategically as they graph $y = \csc(x)$, $y = \sec(x)$, and $y = \cot(x)$; prove trigonometric identities.
- Students will use appropriate tools strategically as they use geometry to visualize the trigonometric functions.

Sample Activity:
Graphing Reciprocal Trigonometric Functions - Students will use the graphs of sine, cosine, and tangent to graph their respective reciprocal functions cosecant, secant, and cotangent. Students are encouraged to use the symmetry of the graph to save themselves time. For example, once they have values for sine and cosecant between $x = 0$ and $x = \pi$, they can use the same values (but negative) between $x = \pi$ and $x = 2\pi$. Students will see that the x-intercepts of $y = \sin(x)$ become the locations of the asymptotes for its reciprocal function. These asymptotes should help students identify the domain and asymptotes for the reciprocal functions.

Unit 9: Matrices *(approximately 9 days)*

STANDARDS
N.VM.6, N.VM.7, N.VM.8, N.VM.9, N.VM.10, N.VM 11, N.VM.12, A.REI.8, A.REI.9

A. In this unit, students learn what a matrix is and how matrices, along with a graphing calculator, can be useful tools for organizing data and solving problems. Students then use matrices to solve complicated systems of equations.

By the second half of the unit, students understand the definition of a linear transformations and relate linear transformations to matrices. Students then investigate compositions of transformations and see how transformations affect geometric figures.

Progression of Content:
This unit is an introduction to matrices, the topic of a Linear Algebra course (usually taken after Calculus) in college. Matrices are also included in college Business Math courses.

B. Unit Assignment(s):
Mathematical Practices used in Unit 9:

- Students will look for and make use of structure, make sense of problems and persevere in solving them as they add, subtract, and start to multiply matrices.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, make sense of problems and persevere in solving them, use appropriate tools strategically as they multiply a vector (regarded as a matrix with one row/column) by a matrix of suitable dimensions to produce another vector, and use matrix multiplication to solve problems.
- Students will reason abstractly and quantitatively, look for and make use of structure as they perform linear transformations using matrices.

Sample Activity:
The Toy Factory - Students learn to use matrices to represent linear situations that involve several variables needed to make two types of toys, cars and trucks requiring different amount of wheels, seats, and different costs to manufacture each type of toy. The goal of the activity is for students to determine whether or not a particular request from a buyer can be fulfilled.

Unit 10: Conics and Parametric Functions *(approximately 11 days)*

STANDARDS
G.GPE.3.1, F.IF.10

A. In this unit, students will analyze shapes that result from slicing a cone with a plane. These shapes are called conic section. In the first section, students will look at circles, ellipses, hyperbolas, and parabolas. They will generate the conics and derive their equations using the formal definitions. Students will recognize conic sections from their equations and complete the square to rewrite the equations in graphing form. Second section focuses on parametrically-defined functions. Students are introduced to the concept of defining x and y in terms of the parameter t. They will see how parametrically-defined functions can be used to model situations involving motion. The final lesson in this section has students solve problems using projectile motion. This is much more powerful than the past work students have completed with parabolas.

Progression of Content:
In calculus, a chapter is devoted to developing calculus tools for other forms of equations: polar, parametric, and vector.

B. Unit Assignment(s):
Mathematical Practices used in Unit 10:

- Students will look for and make use of structure, reason abstractly and quantitatively, use appropriate tools strategically, attend to precision as they derive the equation of a circle and practice completing the square, derive the equation of a hyperbola and ellipse, rewrite parametric equations representing conic sections in rectangular form, apply their knowledge of parametric equations to everyday situations.

Sample Activities:
Where is the Center - Students are reintroduced to algebra tiles which they have used in previous course to rewrite quadratic equation into perfect square forms to solve them. Now they will use algebra tiles to complete the square on both x and y variables which will help in rewrite conic section equations into graphing form. The use of the manipulatives allows students, especially those unfamiliar with completing the square or that lack the experience with algebra tiles to get a full understanding as to why it is called completing the square. Once equations of a circle in this problem are rewritten in this form, students can easily identify the center of the circle.

Flick a Coin - This demonstrates how vertical motion is not affected by horizontal motion. To do this, one coin is flicked while the other coin is dropped. The teacher will need to do a demonstration for the whole class. Fold the 3" × 5" index card in half lengthwise, then fold each half (again lengthwise) in the opposite direction. Squeeze the two middle parts together with your thumb and forefinger creating a T when viewed at the end. Turn the folded index card so

that the T is upside down. Lay the upside-down T on a table and place a coin on either side of the vertical center. The coins should be laid flat, resting against the center of the T, and near the end. Pinch and hold the side opposite of the coins. Slide the card so that the coins and half of the card extend beyond the edge of a flat surface. Now, imagine that this is a pinball machine flipper and quickly flick your wrist. One coin will be projected forward while the other falls straight down. Listen carefully for the sounds as they hit the floor. One sound means they hit at approximately the same time. Theoretically, the two coins should hit the ground at the same time, even though the first coin travels a longer path. This is true because the horizontal and vertical motions are independent.

Unit 11: Polar Functions and Complex Numbers *(approximately 11 days)*

STANDARDS
F.IF.11, N.CN.3, N.CN.4, N.CN.5, N.CN.6

A. In this unit, students transition from graphing rectangular coordinates (x, y), to polar coordinates, which use a distance and an angle. Students will then apply their work with polar coordinates to the world of complex numbers. They will graph complex numbers and learn to rewrite them in polar form. Furthermore, students will also perform operations with complex numbers in polar form, including multiplying, dividing, and computing powers and roots. This unit culminates with students learning to plot points and graph equations using a radius and an angle, and make conversions between polar and rectangular equations

Progression of Content:
It is not until the second year of Calculus that students revisit polar functions through integration and differentiation.

B. Unit Assignment(s):
Mathematical Practices used in Unit 11:

- Students will look for and make use of structure, look for and express regularity in repeated reasoning as they graph polar functions, explore various polar functions, graph complex numbers.
- Students will look for and make use of structure as they convert between polar and rectangular forms.
- Students will look for and make use of structure, use appropriate tools strategically as they represent operations with complex numbers geometrically, and use conjugates to determine moduli and quotients of complex numbers.

Sample Activity:
Polar Coordinates Battleship - Directions/rules for the students are as follows:

- Mark your ships on your polar grid. Each ship must be connected to another ship, either along a ray or around a circle.

- Take turns firing out shots. Each target should be stated in four ways: positive radius and positive angle (+, +), positive radius and negative angle (+, −), negative radius and positive angle (−, +), and negative radius and negative angle (−, −). Both players should record the shots on the charts for further reference.
- If you are the opponent, verify that all of the targets stated are the same location. If not, the player forfeits their turn.
- If the shots miss a ship, the opponent declares "miss" and both players place an open circle in the appropriate location. If the shots hit a ship, the opponent declares "hit" and both players mark an X in the appropriate location.
- You must state when a ship is sunk completely.
- The goal is to sink all of your opponent's ships.

Unit 12: Series and Statistics *(approximately 12 days)*

STANDARDS
A.SSE.2, A.SSE.4, A.APR.5, S.MD.1, S.MD.2, S.MD.3, S.MD.4, S.MD.5

A. In this unit students will begin by calculating the sums of series. Students will derive formulas for and evaluate the sums of arithmetic and geometric series. Students will use limits to evaluate sums of infinite geometric series. At the end of this section students' skills will be applied to analyze some common situations. Second section begins by looking for patterns in the expansion of $(x + y)^n$ and relates the patterns to Pascal's triangle. This leads the use of the Binomial Theorem for the expansion of binomials of the form $(a + b)^n$, where n is a positive integer. Students then apply the patterns from the first lesson of this section to compute probabilities for binomial experiments. In the last section, students will understand what a discrete random variable is as well as the difference between frequency and relative frequency. They will create relative frequency tables for discrete random variables and graph probability distributions as relative frequency histograms. The section continues with calculating the mean and expected value of a discrete random variable. Once students understand these values and how to calculate them, they use these values to make decisions for everyday situations.

Progression of Content:
In Calculus, students will learn tests for determining convergence or divergence of infinite series. And students will learn basic tools if they do decide to move onto a statistical course.

B. Unit Assignment(s):
Mathematical Practices used in Unit 12:
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, reason abstractly and quantitatively, use appropriate tools strategically as they develop a formula for the sum of an arithmetic series.

- Students will use appropriate tools strategically, look for and make use of structure, reason abstractly and quantitatively as they use limits to determine the sum for infinite geometric series.
- Students will make sense of problems and persevere in solving them, use appropriate tools strategically as they apply their knowledge of sums of geometric series to solve problems involving everyday situations and develop the concept of a random variable for discrete random variables. They will graph probability distributions associated with random variables. They will calculate and interpret the mean and expected value of a discrete random variable.

Sample Activity:
Quebare - This problem is launched by showing short video for the "game" they are about to play. For the purpose of this problem, Quebare's moves have been restricted to down left and down right. Students are instructed to discuss strategies for determining the exact number of paths to each block. Using isometric dot paper, plastic sleeves, and dry erase pens. Students can then use the resources to test their strategies. Students may or may not notice at this point that they have seen this pattern before. If they recognize it as Pascal's triangle, allow them to share this with the class. Otherwise, let them continue to work the patterns; the paragraph at the end of the lesson addresses the name and significance of the pattern.

Unit 13: Precalculus Finale *(approximately 13 days)*

STANDARDS
Preparation for Calculus (Addition for Precalculus Honors)

A. Students learned about limits in Unit 7 by using a graphical approach. In this unit, students will use dominant terms to evaluate limits at infinity and algebraic techniques to evaluate limits at a point. Students will also learn to recognize when a technique is appropriate to use.

Furthermore, in this unit, students will understand what area under a curve represents and how to approximate it using trapezoids, and by writing and using an area under a curve program with a graphing calculator.

This unit is culminated as students build conceptual understanding between the slope of a function and the area under the curve of a function's derivative, two concepts developed throughout this course. You will also learn how to write slope functions for power functions.

Progression of Content:
By the end of this unit, and essentially this course, students will be ready for Calculus.

B. Unit Assignment(s):

Mathematical Practices used in Unit 13:

- Students will look for and express regularity in repeated reasoning, reason abstractly and quantitatively as they begin a formal understanding of limits. Students will understand what a dominant term is and use the idea of dominant terms to evaluate limits at infinity.
- Students will reason abstractly and quantitatively, attend to precision as they investigate the number e as a limit in the indeterminate form $(1)^{\infty}$ and learn how the number e is important to mathematics.
- Students will attend to precision, construct viable arguments and critique the reasoning of others as they approximate area under a curve using trapezoids and compare the results obtained using trapezoids to results obtained using left endpoint and right endpoint rectangles. Students will also realize that a trapezoidal approximation is the average of left endpoint and right endpoint rectangle approximations.
- Students will make sense of problems and persevere in solving them as they sketch velocity graphs and position graphs and develop connections between the two types of graphs.

Sample Activity:

A Race to Infinity - Through this activity, students will be evaluating eight functions, whose end behavior can be described as follows: x, y. But, the important part is to determine which of these functions would approach infinity faster when comparing exponential, power, and logarithmic functions with b>1. This activity sets the premise for "dominant" functions when students then evaluate algebraic rational expressions containing any of these functions either in the numerator or on the denominator. The end goal of this activity is for students to realize that: (1) exponential functions with larger bases will dominate the exponential family, (2) of the power functions, the function with the highest power will dominate. Since radical expressions can be rewritten using an exponent, they are in the power function family, and (3) that logarithms with the smallest base ($b > 1$) would dominate.

Comprehensive Final Exam Details

1. Students will be tested on their knowledge of the following topics:
    - 3-Variable Systems
    - Prerequisites from Algebra and Geometry
    - Trigonometric Functions
    - Analytic Trigonometry
    - Laws of Sines, Cosines
    - Polar and Vectors
    - Complex Numbers
    - Exponential and Logarithmic Functions

- Topics in Analytic Geometry, including Conics
- Functions and Models
- Limits and Derivatives
- Differentiation Rules
- Applications of Differentiation

2. The Final Exams - much like unit/chapter exams - are detail-oriented and require students to provide detailed, step-by-step justification for their responses to each of the questions. This way, they get trained and prepared for their future AP Math courses/exams.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Integrated Math IIIB/Precalculus Accelerated
Course Code:	*(Educational Services will assign course number **after** Board Approval)*
School(s) Course Offered:	Clark Magnet High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated II/IIIA Accelerated or Integrated II + (Summer) Integrated Math IIIA Accelerated
Recommended Textbook:	*Core Connections Integrated III* Judy Kysh, Evra Baldinger, Michael Kassarjian, Karen Wootton, et. al CPM Educational Program Second Edition, Version 5.0 *Precalculus: Mathematics for Calculus* James Stewart, Lothar Redlin, Saleem Watson Cengage Learning Seventh Edition

Course Overview:

Integrated Mathematics IIIB/Precalculus Accelerated is part two of a two-part compacted math series. Following Integrated Mathematics II/IIIA Accelerated, this course provides students with instruction in the second half of the content of the Integrated Math III and all of the course content for Precalculus. This compression is designed as the single point of

acceleration at the high school level as recommended by the California Mathematics Framework. This course is aligned to the California Common Core State standards for high school mathematics and supports the Standards for Mathematical Practice. With this course, students will develop a deep conceptual understanding of the mathematical relationships and concepts needed to succeed in higher level math courses.

In addition to covering the second half of Integrated III standards, this course meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking.

In addition to the second half of Integrated III standards, this courses covers the same material as Precalculus Honors, by adding and adds rates of change, limits and area under the curve to the standard Precalculus course.

Course Content:

Semester A

Unit 5: Inverses and Logarithms *(approximately 11 days)*

STANDARDS
F-BF.3, F-BF-4, F-BF.4a, F-LE.4, F-LE.4.2, I-IF.7e

A. Reversing is an important theme in the early part of this chapter. The first section introduces the concept of inverse relations. Students learn that reversing, or working backward to undo the action of a function, can create a new function. They explore multiple representations of functions and their inverses, and recognize that many functions have inverses that are not functions. In the second, students determine inverses of parent functions. They learn that the inverse of an exponential function is a logarithm. Reversing is emphasized once again as they learn how to convert exponential equations into logarithmic form, and vice versa. Students investigate the new family of logarithmic functions $f(x) = \log_b(x)$ for different values of b, test values on their calculators to determine the base the calculators work in, and learn to graph transformations of $f(x) = \log(x)$.

Progression of Content:
This chapter adds to students' lists of parent functions, which will continue to expand with the addition of polynomial functions in Unit 8 and trigonometric functions in Unit 9.

B. Unit Assignment(s):
Mathematics Practices Used in Unit 5:

- Students will look for and make use of structure and construct viable arguments as they develop and justify strategies for undoing functions and as they investigate different bases for logarithms..
- Students will use appropriate tools strategically and look for and make use of structure when they graph inverses of functions and write their equations.
- Students will look for and make use of structure as they verify inverses using multiple representations, and attend to precision as they restrict the domain of a function to ensure that its inverse is also a function.
- Students will construct viable arguments and critique the reasoning of others and look for and make use of structure as they apply their knowledge of parent graphs and inverses to learn about logarithms.
- Students will look for and make use of structure and express regularity in repeated reasoning as they learn the definition of logarithm and calculate the values of logarithms.
- Students will construct viable arguments and critique the reasoning of others, use appropriate tools strategically, and look for and make use of structure as they investigate logarithms with different bases.

Sample Activities:
Guess My Number Game - Students are asked to guess the number the teacher is thinking of based on the order of operations applied to the number and what the mystery number has ultimately transformed into. Students may or may not write an equation, but you may want to encourage them to do so as it will help when they progress to working with functions and inverses. Making sure that the idea of reversing, or undoing, comes up in the discussion of the "Guess My Number" game. You undo each step, reversing the original Order of Operations.

Graph the Inverse Function - Students will be looking at strategies for creating graphs of inverse functions. The first two graphs have functions that they are capable of finding the equation of their inverse functions but the third function does not lend itself to be solved for the inverse function. Teams could make a mini-table of some coordinates from the graph and then use it to help make a mini-table for the inverse graph. Students will soon discover that the line $y = x$ is the line of symmetry.

Unit 7: Logarithms and Triangles *(approximately 13 days)*

STANDARDS
F-LE.3, F-LE.4, F-LE.4.1, F-LE.4.3, A-SSE.2, F-BF.1, F-IF.7e, G-SRT.9+, G-SRT.10+, G-SRT.11+

A. In this unit, students return to their work with logarithms to develop tools they can use when solving application problems involving exponential equations. In the first half of this unit, students investigate the family $y = \log(m^n)$ and discover the Power Property of Logarithms, which allows them to solve exponential equations by using logs to undo or rewrite the equation. Students generalize from number patterns to make conjectures about other properties of logarithms and then prove these properties. Furthermore, students develop and share strategies to write the equation of the exponential function with a given asymptote that passes through two given points. Then they use that equation to make predictions.

The remainder of this unit focuses on completing a tool kit for calculating missing parts of non-right triangles. Students identify the types of information needed to determine all of the missing sides and angles of a triangle. Through this exercise, students also identify triangles for which they do not yet have the tools to determine missing parts. Students notice that they *do* have enough tools to calculate the measures and side lengths of right triangles. This leads to the question, "*What if the triangle is not a right triangle?"* Students then develop the Law of Sines and Law of Cosines so that they have a complete set of tools to determine the other missing parts of any triangle (when sufficient information is provided).

The unit concludes with students looking at different application problems using triangles and identifying which tools are most useful in each situation. In addition, students investigates the ambiguous case of triangles: SSA. This lesson is offered for accelerated classes or those that could benefit from a complete view of the relationships between the sides and angles of a triangle. Working through the problems of this lesson before you decide to use the lesson with your students is highly recommended.

Progression of Content:
The work with logarithms in this unit prepares students for future work in a pre-calculus course. Working with Law of Sines and Cosines and reviewing the use of right triangle trigonometry and special right triangles prepares students for working with the trigonometric family of functions in Unit 9.

B. Unit Assignment(s):
Mathematics Practices Used in Unit 7:

- Students will look for and make use of structure and express regularity in repeated reasoning while they develop the Power Property of Logarithms, learn other properties of logs and how to rewrite equations with different bases.

- Students will make sense of problems and reason abstractly and quantitatively as they write the equation of an exponential function given two points and an asymptote.
- Students will make sense of problems and persevere in solving them, model with mathematics, and reason abstractly and quantitatively as they explore exponential functions with an asymptote other than $y = 0$ and apply logarithms to solve an exponential equation.
- Students will make sense of problems and persevere in solving them as they figure out what information they need to solve for parts of triangles. They will need to attend to precision as they communicate what they know and do not know.
- Students will look for and express regularity in repeated reasoning as they develop the ratios for the Law of Sines.
- Students will make sense of problems and persevere in solving them using the Law of Cosines.
- Students will attend to precision as they work with triangles involving the SSA relationship. They must also use appropriate tools strategically as they explore the ambiguous case of the Law of Sines.
- Students will reason abstractly and quantitatively as they make sense of problems and persevere in solving them. They will attend to precision as they solve the problems and communicate within their teams, labeling diagrams, attending to units, and calculating their answers accurately.

Sample Activities:
"The Case of the Cooling Corpse" - a problem in which students model the falling temperature of a corpse to establish time of death and solve a murder mystery. In order to solve the mystery, students will need to decide which information is relevant to solving the problem (e.g., body temperature, times listed on sign-in sheets, etc.) . Students will need to write and solve a system of exponential functions, with a horizontal asymptote representing the room temperature, the independent variable as time, and the dependent variable as the temperature of the body.

Solving Triangles - This activity consists of eight independent triangle problems (suggestion is to assign one problem to a group of 3-4 students) that will provide students with a chance to consolidate their understanding of the various tools and strategies they have developed so far to solve triangle problems. Some problems may be solved using the Law of Sines, Law of Cosines, or a combination of both. Students will present their assigned problem to the entire class and their process for solving the assigned problem.

Unit 8: Polynomials *(approximately 15 days)*

STANDARDS
A-APR.1, A-APR.2, A-APR.4, A-APR.6, A-APR.3, F-IF.4, F-IF.7c, N-CN.8+, N-CN.9+, A-SSE.2, A-CED.2, F-BF.1

A. In the first section, students will investigate the equation ↔ graph connections for polynomial functions. They will recognize that equations in factored form are much easier to sketch, and they will understand the relationship between the factors and the x-intercepts of the graph. Then, in the second section, they will develop an understanding of imaginary and complex numbers and recognize that polynomial functions can have complex roots. In the third and last section, they will learn to divide polynomials by a known factor to find other factors. This will allow them to determine complex and irrational roots of some cubic and quartic functions.

Progression of Content:
Students will build on their understanding of function families in Unit 9, where they study trigonometric functions and transform the graphs of sine and cosine functions. Students will use their algebra skills when they study rational expressions in Unit 11. Students will also use their algebra skills when they prove formulas for sums of series in Unit 10 and solve trigonometric identities in Unit 12.

B. Unit Assignment(s):
Mathematics Practices used in Unit 8:

- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they discuss factored form and describe the graphs of polynomials and their understanding of the stretch. Students will also look for and make use of structure as they draw graphs of polynomials.
- Students will look for and make use of structure as they continue their polynomial investigation. Students will also construct viable arguments and critique the reasoning of others as they consolidate their results on polynomials.
- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others as they develop their understanding of a stretch factor. Student will also model with mathematics as they develop an equation for the roller coaster problem first introduced in the first lesson of Unit 8.
- Students will look for and make use of structure as they use polynomial division to determine factors of polynomials. Students will also construct viable arguments and critique the reasoning of others as they develop their understanding of polynomial division.
- Students will look for and make use of structure as they use complex roots to write equations of quadratic functions and express regularity in repeated reasoning as they identify polynomial identities to help them factor. Students will also look for and express regularity in repeated reasoning as they identify patterns in the sums and products of complex roots.
- Students will make sense of problems and persevere in solving them and construct viable arguments and critique the reasoning of others when they determine all

roots of a polynomial with a degree greater than two and when they determine all roots of a polynomial with a degree greater than two.

Sample Activities:
Polynomial Function Investigation - Students are instructed to look for, label, and describe the *x*-intercepts and "bounces" (double roots, although students will probably not use this term), the *y*-intercept, the number of turns, and the behavior of graphs for very large and very small *x*-values. They should share and discuss all of their graphs and their observations within their teams. The discussion should lead to conjectures and the creation of several new equations to try. Students are coming up with methods for determining the *x*- and *y*-intercepts, predictions about the numbers of crossings of the *x*-axis, and ideas for determining a reasonable window or maximum and minimum approximations.

Game of Polydoku - By treating division as a puzzle and using the organizational device of an area model, students can use logical reasoning to reverse the multiplication process and figure out a missing factor. Once they have worked through the process several times, they should be able to set up and solve their own division problems. This method is as efficient as (if not more efficient than) polynomial "long division" and you can use it to develop synthetic division if that is part of your curriculum. This game introduces polynomial division by challenging students to reverse the process of polynomial multiplication.

Unit 11: Rational Expressions and Three-Variable Systems *(approximately 6 days)*

STANDARDS
A-APR.7+

A. In this chapter, students will focus on operations with rational expressions. Students did a function investigation in Unit 1 that previewed the investigation of rational expressions. Students learn a powerful method of simplifying rational expressions that uses properties of the number 1 and the properties of exponents. In a previous course, students learned to solve a system of two linear equations in two variables, and they reviewed this topic in Chapter 3 of this text.

Progression of Content:
The remaining chapter requires students to use their algebra skills to solve trigonometric identities. In future courses, students may use matrices to solve systems of equations.

B. Unit Assignment(s):
Mathematics Practices Used in Unit 11:

- Students will look for and make use of structure as well as look for and express regularity in repeated reasoning as they use the number 1 to understand rational expressions.

- Students will also look for and make use of structure as well as look for and express regularity in repeated reasoning as they connect multiplication and division of fractions to that of rational expressions.
- Students will look for and make use of structure as they make connections between adding and subtracting fractions and adding and subtracting rational expressions, and as they locate points in three-dimensional space. They will construct viable arguments and critique the reasoning of others as they justify their strategies.
- Students will continue to look for and make use of structure as well as look for and express regularity in repeated reasoning as they work with rational expressions. They will construct viable arguments and critique the reasoning of others as they investigate the closure of rational expressions under operations.
- Students will reason abstractly and quantitatively and look for and express regularity in repeated reasoning as they write the equation of a quadratic function by solving a system of three equations with three unknowns.

Sample Activity:
Giant One - Students are encouraged to rewrite rational expressions to create fractions that will reduce to one. The new expressions will be reduced to its simplest form. This strategy to rewrite will allow students to simplify rational expression after doing basic operations on the original expressions.

Chapter 1: Fundamentals *(approximately 15 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, N.CN.7, A.SSE.3a, A.CED.1, A.CED.2, A.CED.3, A.CED.4, A.REI.2, A.REI.3, A.REI.4, A.RED.4a, A.REI.4b, F.IF.1, F.IF.2, F.IF.4, F.IF.5, F.IF.7, F.IF.7b, F.IF.8, G.GPE.1, G.GPE.5, G.GPE.6, G.GPE.7

A. In the first chapter, students will review the real numbers, equations and the coordinate plane. Students will get a fresh look at these review concepts by applying them to real world problems.

Major Topics:
Real numbers
Exponential, radical and rational expressions
Complex numbers
Inequalities
Lines, circles

B. Unit Assignment:
After completing section 1.12, students will use their understanding of proportionality to determine how a frog's size relates to its sensitivity to pollutants in the environment. They will explore how animals, of the same body type, will have a skin area and volume

that are proportional to the length of their body. The students will be able to calculate proportionality according to body length, weight, surface skin area, and volume.

Mathematical Practices Used in Ch. 1:

- MP.1: Students will explain to themselves the meaning of a problem and look for entry points to its solution. They analyze givens, constraints, relationships and goals for modeling questions regarding inequalities and proportions. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt.
- MP.2: Students make sense of quantities and their relationships in problem situations. They are able to abstract a given situation and represent the relationship between two variables symbolically, as in direct and indirect variation.
- MP.3: Students learn how to use stated assumptions, definitions and previously established results in constructing arguments and equations to represent real world situations. They will utilize the distance*rate=time equation and proportional relationships to analyze situations that take into account the context of each question.

Chapter 2: Functions *(approximately 10 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, A.SSE.3b, A.CED.2, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7a, F.IF.7b, F.IF.8, F.IF.8a, F.BF.1, F.BF.1a, F.BF.1b, F.BF.3, F.BF.4, F.BF.4a, F.BF.4b, F.BF.4c, F.BF.4d, F.LE.2, S.ID.6a, S.ID.6b, S.ID.7

A. In this chapter students will study functions and their graphs, as well as many real-world applications of the functions.

Major Topics:
Graphs of Functions
Average Rate of Change of a Function
Transformations of Functions
Combining Functions
One-to-one Functions and their Inverses

B. Unit Assignment:
After completing Section 2.3, students will give a verbal summary of a situation described by a graph. In this assignment students describe, or tell the story that corresponds to a, given graph as well as make graphs that corresponds to a real-world "story".

Mathematical Practices Used in Ch. 2:

- MP.4: Students will model linear relationships in real world situations and use average rate of change to interpret and quantify the relationship between two variables.
- MP.6. Students will label axes and specify key points to clearly and accurately represent the different type of basic functions such as the linear function, reciprocal function and greatest integer function. Students will also attend to precision for piece-wise functions, ensuring that endpoints are clearly marked and representative of the corresponding domains.
- MP.7: Students will be able to interpret average rate of change within the context of a question and express the significance of the value to the problem. The students will be able to step back and overview transformations of functions as they apply to all types of parent functions and can interpret the structure of functions as a simple transformation on the parent function.

Chapter 3: Polynomials and Rational Functions *(approximately 9 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, A.SSE.3b, A.SSE.3c, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7c, F.IF.7d, F.IF.8b, F.BF.1a

A. In this chapter students will study polynomial and rational functions and their graphs, as well as many real-world applications of the functions.

Major Topics:
Quadratic Functions and Models
Polynomial Functions and Their Graphs
Real Zeros of Polynomials
Complex Zeros and the Fundamental Theorem of Algebra
Rational Functions
Polynomial and Rational Inequalities

B. Unit Assignment
After completing Section 3.2, students will experience the process of collecting data and then analyzing the data using linear regression. In this assignment students will construct bridges out of paper and use pennies as weights to determine how strong each bridge is. Students will model the data with linear and power functions to determine which model best fits the data. The model will allow students to predict the strength of a large bridge before it is built.

Mathematical Practices Used in Ch. 3:

- MP.2: Students will be able to reason abstractly by understanding the general importance of a power function to the graph of a polynomial. The students will also be able to contextualize the significance of the end behavior and zeros of the function.

- MP.4: Students can model real world situations with fluctuations by using polynomial functions. They can use the properties of polynomial functions to help contextualize the problem.
- MP.7: Students will be able to discern a pattern in the factored form of a polynomial and its relationship to the x-intercepts of a graph. They will also be able to recognize the significance of the power function of the expanded form of a polynomial and the end behavior of the graph.

Chapter 4: Exponential and Logarithmic Functions *(approximately 9 days)*

STANDARDS
N.Q.1, N.Q.3, A.SSE.3c, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7e, F.IF.8b, F.BF.5, F.LE.4

A. In this chapter students will study exponential functions where the independent variable is in the exponent. Exponential functions are used in modeling many real-world situations. The inverse function of exponential functions are called logarithmic functions. Once an exponential model has been obtained, students will use the model to predict things such as the size of a population or the growth of an investment.

Major Topics:
Exponential Functions
The Natural Exponential Function
Logarithmic Functions
Laws of Logarithms
Exponential and Logarithmic Equations
Modeling with Exponential Functions
Logarithmic Scales

B. Unit Assignment:
After completing Section 4.3, students will use logarithms or orders of magnitude to compare sizes of objects. It is often difficult to compare objects that vary enormously in size. In this assignment students learn how logarithms can be used to define the concept of "order of magnitude" which provides a simple way of comparison of these objects.

Mathematical Practices Used in Ch. 4:
- MP.2: Students will be able to quantitatively understand the structure of a logarithmic and exponential function separately as well as the inverse relationship of the functions. They will also be able to understand how the key features of a graph are represented in the algebraic expressions.
- MP.4: Students will be able to model a data set by using a linear, quadratic, exponential or logarithmic expression. Students will be able to determine which function best fits the data by identifying key points as well as end behavior.

- MP.5: Students will be able to determine when it is appropriate to use a graphing utility to fit an exponential or logarithmic curve to model a data set.

Semester B

Chapter 5: Trigonometric Functions: Unit Circle Approach *(approximately 8 days)*

STANDARDS
N.Q.2, N.Q.3, F.IF.8, F.LE.2, F.TF.1, F.TF.2, F.TF.3, F.TF.8, G.SRT.6, G.SRT.7, S.ID.6a

A. In this chapter students will study one way of viewing trigonometric functions, as functions of real numbers. Students will see in this chapter how the trigonometric functions are used to model periodic motion.

Major Topics:
The Unit Circle
Trigonometric Functions of Real Numbers
Trigonometric Graphs
Inverse Trigonometric Functions and Their Graphs
Modeling Harmonic Motion

B. Unit Assignment:
After completing Section 5.3 students will consider an application to biology. In this assignment students will use sine functions to model the population of a predator and its prey. An isolated island is inhabited by two species of mammals: lynx and hares. The lynx are *predators* who feed on the hares, their *prey*. Students will find functions of the form y=asink(t-b)=c that model the lynx and hare populations from a given graph.

Mathematical Practices Used in Ch. 5:

- MP.2: Students will be able to reason abstractly by understanding how the even-odd properties of a trigonometric function is related to the direction of rotation of the angle measure and the quadrant in which the terminal side is drawn.
- MP.5: Students will be able to determine when it is appropriate to use a graphing utility to model periodic phenomena with a sinusoidal function. Students will be able to fit a trigonometric function by identifying the key features of the graph.
- MP.6: Students will be able to clearly define the meaning of the variables in a trigonometric equation by identifying which is an angle and what specific ratio is defined. Students will also be able to accurately label axes according to the expression being graphed, whether the unit circle or a trigonometric function.

Chapter 6: Trigonometric Functions: Right Triangle Approach *(approximately 9 days)*

STANDARDS
F.TF.3, F.TF.4, G.SRT.6, G.C.5

A. In this chapter students will study another way of viewing trigonometric functions, as functions of angles. Students will see in this chapter the relationships between angles and distances.

Major Topics:
Angle Measures
Trigonometry of Right Triangles
Trigonometric Functions of Angles
Inverse of Trigonometric Functions and Right Triangles
The Law of Sines
The Law of Cosines

B. Unit Assignment:
After completing Section 6.2 students will investigate how areas and volumes of similar figures change as the size of the figure increases (or decreases). In this assignment students will find power functions that relate these quantities and use those functions to explore the possibility of the existence of a real-life giant ape. Students will begin by finding some properties of similar figures.

Mathematical Practices Used in Ch. 6:

- MP.1: Students will be able to analyze the given information for an oblique triangle and will persevere in determining the best law (either law of cosines or sines) to solve the triangle. Students will also be able to determine when the ambiguous case for the law of sines applies and will solve for both possible triangles, when necessary.
- MP.3: Students will be able to determine when, for an ambiguous triangle, the second case does or does not work and can create a viable argument as to why.
- MP.4: Students will be able to model real world situations with right and oblique triangles and will be able to use the laws of cosine and sine and the properties of right triangles to determine distances and angles.

Chapter 7: Analytic Trigonometry *(approximately 8 days)*

STANDARDS
N.Q.1, N.Q.2, F.IF.7, F.IF.7e, F.TF.4, F.TF.5, F.TF.7, F.TF.8

A. In this chapter students will study algebraic properties of trigonometric functions. Students will simplify and factor expressions and solve equations that involve trigonometric functions.

Major Topics:
Trigonometric Identities
Addition and Subtraction Formulas
Double-Angle, Half-Angle and Product-Sum Formulas
Basic Trigonometric Equations

B. Unit Assignment:
After completing Section 7.3 students will use trigonometry to find the best location from which to view a painting or a movie. In this assignment, students will use graphing devices and the Law of Cosines to find the best viewing angle possible.

Mathematical Practices Used in Ch. 7:

- MP.1: Students will look for entry points to a trigonometric identity proof and will persevere in looking for relationships to equate the two expressions. Students will analyze the given expressions to determine a solution pathway instead of jumping into a solution attempt.
- MP.2: Students will be able to reason through a trigonometric equation by being able to reason abstractly and seeing a quadratic form that requires factorization. Students will also be able to reason quantitatively by identifying the relationships between the ratios of sides with the corresponding angle measures.
- MP.3: Students will be able to build a logical progression of statements to provide a proof for a trigonometric identity by utilizing the quotient identities, Pythagorean identities, as well as the sum, difference, double- and half-angle formulas.

Chapter 8: Polar Coordinates and Parametric Equations *(approximately 7 days)*

STANDARDS
F.IF.7, F.IF.7e, F.TF.4, F.TF.5, F.TF.8

A. In this chapter students will study a different way of locating points in the plane. Instead of using rectangular coordinates to specify a location, students will give distance and direction from a fixed reference point.

Major Topics:
Polar Coordinates
Graphs of Polar Equations
Polar Form of Complex Numbers: De Moivre's Theorem
Plane Curves and Parametric Equations

B. Unit Assignment:
After completing the chapter, students will use parametric equations and trigonometry to model the path of a projectile in motion. Students will be able to utilize coordinate geometry to realize how changing the angle of projection affects the domain and range of motion.

Mathematical Practices Used in Ch. 8:

- MP.1: Students will be able to visualize the graphing of a complex number as it relates to right triangle trigonometry and how this relationship allows for the conversion between rectangular and polar systems.
- MP.2: Students will be able to relate the roots of a complex number as points equally spaced about a circle and will be able to relate the periodicity of a sinusoidal function to help identify the polar form of the roots.
- MP.3: Students will be able to analyze the relationship between rectangular coordinates and the path of a point moving on a plane to eliminate a parameter and convert between rectangular and parametric equations.

Chapter 9: Vectors in Two and Three Dimensions *(approximately 9 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, F.TF.6, F.TF.7, G.SRT.8, G.SRT.9

A. In this chapter students will be able to represent quantities, such as force, with vectors that are defined by magnitude and direction. Students will also study how several forces acting on an object will affect the movement of that object.

Major Topics:
Vectors in Two Dimensions
The Dot Product
Three-Dimensional Coordinate Geometry
Vectors in Three Dimensions
The Cross Product
Equations of Lines and Planes

B. Unit Assignment:
After completing the chapter, students will use vector fields to model real-world scenarios, like the gravitational force on the earth or wind on the surface of the earth. Students will be able to then analyze the vector fields to identify the center and direction of motion.

Mathematical Practices Used in Ch. 9:

- MP.4: Students will be able to graph vectors in the cartesian system and use the dot product to find the angle between two vectors as well as the direction angles of a vector.

- MP.5: Students will use proper graphing utilities to help them visualize and analyze three-dimensional vectors and cross product vectors.
- MP.6: Students will attend to precision by properly drawing and labeling axes to graph in three dimensions.

Chapter 10: Systems of Equations and Inequalities *(approximately 15 days)*

STANDARDS
N.Q.1-3, N.CN.4, N.CN.5, N.VM.1-5, A.REI.5, N.REI.6, G.SRT.10, G.SRT.11

A. In this chapter, students will use more than two variables to create and solve a system of equations and inequalities. Students will be able to adapt the elimination and substitution methods of solving systems with two variables to now solve systems with three or more variables as well as learning new methods of solving, such as utilizing matrices and Cramer's Rule.

Major Topics:
Systems of Linear Equations in Two Variables
Systems of Linear Equations in Several Variables
Matrices and Systems of Linear Equations
The Algebra of Matrices
Inverses of Matrices and Matrix Equations
Determinants and Cramer's Rule
Partial Fractions
Systems of Nonlinear Equations
Systems of Inequalities

B. Unit Assignment:
After section 10.4, students will use matrix multiplication to project the population proportions of the young, juvenile and adult proportions of a population of animals. Students will use these predictions to analyze the health and growth of the population for the coming seasons in order to understand the long-term prospects of the population.

Mathematical Practices Used in Ch. 10:
- MP.2: Students will analyze a linear system of equations and inequalities and understand that there are multiple methods of solving a system – i.e. substitution, elimination, augmented matrices, Cramer's rule, etc.
- MP.4: Students will understand how to create a matrix to represent data and how matrix operations can be used to analyze the data.
- MP.5: Students will understand how a matrix can be used to represent equations and data and how to algebraically manipulate matrices to solve linear systems.

Chapter 11: Conic Sections *(approximately 9 days)*

STANDARDS
N.VM.7-12, A.REI.7-9, A.REI.12

A. In this chapter, students will understand how conic sections are different cross-sections of a cone. Students will be able to identify the equations of different conics as well as their geometric properties and their graphs.

Major Topics:
Parabolas
Ellipses
Hyperbolas
Shifted Conics
Rotation of Axes
Polar Equations of Conics

B. Unit Assignment:
At the end of the chapter, students will study the use of conics in architecture and how the geometric properties of each conic can create architectural features, such as a whispering gallery. Students will also learn practical methods by which conics could be constructed with by using practical construction tools.

Mathematical Practices Used in Ch. 11:

- MP.1: Students will be able to transform the general form of a conic into the standard form of the respective conic to determine key features.
- MP.2: Students will be able to identify the type of conic from the general form.
- MP.4: Students will be able to model real world situations with the appropriate conic type and use the key features to solve problems.

Chapter 12: Sequences and Series *(approximately 9 days)*

STANDARDS
G.GPE.2, G.GPE.3, G.GMD.4

A. In this chapter, students will study different types of sequences, such as geometric, arithmetic and the Fibonacci sequences and their applications in the real world. Students will be able to recognize, formulate and apply sequences to real world situations as well as being able to evaluate the sum of a series.

Major Topics:
Sequences and Summation Notation
Arithmetic Sequences

Geometric Sequences
Mathematics of Finance
Mathematical Induction
The Binomial Theorem

B. Unit Assignment:
At the end of this chapter, students will be able to apply their knowledge of recursive and explicit formulas of a sequence to analyze and evaluate practical problems, such as a monthly savings account as well as the accumulation of pollutants in the environment. They will be able to predict future values of account balances as well as the percentage of pollutants in the environment after *n* number of years.

Mathematical Practices Used in Ch. 12:

- MP.5: Students will be able to identify the strengths of using the binomial theorem vs. Pascal's triangle but still understand the complementary relationship between the two.
- MP.7: Students will discern a pattern in a sequence or series and identify whether it is arithmetic or geometric.
- MP8: Students will be able to formulate an explicit and/or recursive formula to represent various sequences and series.

Chapter 13: Limits - A Preview of Calculus *(approximately 8 days)*

STANDARDS
N.CN.8, N.CN.9, A-APR.2, A.APR.3

A. In this chapter, students will understand the definition of one-sided and the overall limit and its applications in calculus, such as finding the instantaneous rate of change as well as the area of a bounded region. Students will understand the laws and the definition of alimit of an average rate of change as the instantaneous speed.

Major Topics:
Finding Limits Numerically and Graphically
Finding Limits Algebraically
Tangent Lines and Derivatives
Limits at Infinity; Limits of Sequences
Areas

B. Unit Assignment:
By the end of the chapter, students will apply their knowledge of finding the area under a curve by finding the total distance of a car traveling for a set amount of time at a designated speed, in miles per hour.

Mathematical Practices Used in Ch. 13:

- MP.2: Students will be able to determine when the limit of a function exists both algebraically and graphically.
- MP.3: Students will be able to justify why the slope of a tangent line must equal 0 at any local maximum or minimum value and its significance.
- MP:6: Students will be able to clearly communicate the conditions for which the limit of a function does and does not exist.

Chapter 14: Probability and Statistics *(approximately 13 days)*

STANDARDS
A.SSE.4, A.APR.5, A.APR.6, A.APR.7, F.IF.3, F.BF.1a, F.BF.2, F.LE.2

A. In this chapter, students will study events that are governed by randomness and have a predictability to them. Students will understand that not all situations can be precisely determined or calculated, but can be analyzed and predicted using probability rules. Students will be able to collect, organize and analyze data using statistical methods, such as the 5-number summary.

Major Topics:
Counting
Probability
Binomial Probability
Expected Value
Descriptive Statistics (Numerical)
Descriptive Statistics (Graphical)
Introduction to Statistical Thinking
Introduction to Inferential Statistics

B. Unit Assignment:
After section 14.6, students will understand how statistics can be used to mislead and misinform. Students will then be able to analyze studies and newspaper articles that quote statistics and identify sources of potential bias.

Mathematical Practices Used in Ch. 14:

- MP.2: Students will be able to use quantitative reasoning to find the probabilities for events, including conditional probability.
- MP.5: Students will be able to use Venn diagrams appropriately to represent the probabilities for the union and intersection of two events as well as for conditional probability. Students will also be able to use a stem and leaf plot to represent data and to find a 5-number summary.

- MP.6 Students will accurately be able to calculate a 5-number summary in order to properly create a visual summary of the statistics, such as a normalized distribution or a box and whisker plot.

Comprehensive Final Exam Details

1. Students will be tested on their knowledge of the following topics:
    - 3-Variable Systems
    - Prerequisites from Algebra and Geometry
    - Trigonometric Functions
    - Analytic Trigonometry
    - Laws of Sines, Cosines
    - Polar and Vectors
    - Complex Numbers
    - Exponential and Logarithmic Functions
    - Topics in Analytic Geometry, including Conics
    - Functions and Models
    - Limits and Derivatives
    - Differentiation Rules
    - Applications of Differentiation
2. The Final Exams - much like unit/chapter exams - are detail-oriented and require students to provide detailed, step-by-step justification for their responses to each of the questions. This way, they get trained and prepared for their future AP Math courses/exams.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Integrated Math IIIB/Precalculus Accelerated
Course Code:	*(Educational Services will assign course number **after** Board Approval)*
School(s) Course Offered:	Hoover High School, Crescenta Valley High School, Verdugo Academy
UC/CSU Approved (Y/N, Subject):	Y, mathematics "c"
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated II/IIIA Accelerated
Recommended Textbook:	*California Integrated Mathematics 3* Timothy D. Kanold, Edward B. Burger, Juli K. Dixon, Matthew R. Larson, Steven J. Leinwand Houghton Mifflin Harcourt 2015 *Precalculus: Mathematics for Calculus* James Stewart, Lothar Redlin, Saleem Watson Cengage Learning Seventh Edition

Course Overview:

Integrated Mathematics IIIB/Precalculus Accelerated is part two of a two-part compacted math series. Following Integrated Mathematics II/IIIA Accelerated, this course provides students with instruction in the second half of the content of the Integrated Math III and all of the course content for Precalculus. This compression is designed as the single point of

acceleration at the high school level as recommended by the California Mathematics Framework. This course is aligned to the California Common Core State standards for high school mathematics and supports the Standards for Mathematical Practice. With this course, students will develop a deep conceptual understanding of the mathematical relationships and concepts needed to succeed in higher level math courses.

In addition to covering the second half of Integrated III standards, this course meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking.

In addition to the second half of Integrated III standards, this courses covers the same material as Precalculus Honors, by adding and adds rates of change, limits and area under the curve to the standard Precalculus course.

Course Content:

Semester A

Unit 6 Trigonometric Functions *(approximately 15 days)*

STANDARDS
G-STR.8, G-SRT.10, F-TF.1, F-TF.2, F-TF.5, F-TF.8, F-IF.7e

A. This unit builds on the introductory trigonometric function learning from CC Integrated Mathematics II. Students will solve real life problems using trigonometric functions and Pythagorean identities. They will also work with transformations of graphs of trigonometric functions.

Major Topics:
Defining trigonometric functions with the unit circle
Laws of sines and cosines
Evaluating trig functions
Angle rotation and radian measure
Transformations of the parent graphs of trigonometric functions

B. Unit Assignment(s):
At the end of this unit, students will complete a Math in Careers task by using models to represent the motion of a paddle wheel. Critical skills include graphing a trigonometric function, describing what its parameters mean for the real world situation, and using the function to make a prediction.

Students will graph a function for a riverboat paddle wheel with a given diameter and revolution rate that hangs a specific distance below the water line during an identified time interval. Students will describe the significance of the intercepts, the maximum and minimum values for the situation. They will also predict how revolutions it will take for a point on the wheel to have traveled one mile.

Mathematical Practices Used in Unit:

- MP.2 Students will be able to reason abstractly in order to understand the relationship between the unit circle and the graphs of the trigonometric functions.
- MP.5 Students will be able to determine when it is appropriate to model periodic phenomena with a sinusoidal function. Students will use their knowledge of the key features of a trigonometric function to help fit the function to the model.
- MP.8 Students will look for and express regularity in repeated reasoning when organizing their work to find the angle measures of a triangle. Students will reason whether the measures given produce one triangle, two triangles or no triangle by using the Law of Sines.

Unit 7: Statistics and Decision Making *(approximately 12 days)*

STANDARDS
S-IC.1, S-IC.2, S-IC.3, S-IC.4, S-IC.5, S-ID.4, S-MD.6, S-CP.4

A. In this unit students will learn about statistics and using them to make sound decisions. They will gather and display data and find specific data points.

Major Topics:
Gathering and displaying data
Shape, center, and spread
Data distributions
Confidence intervals and margins of error
Using probability in making and analyzing decisions

B. Unit Assignment(s):
After completing this unit, the students will perform a statistical hypothesis test. Critical skills include writing a null hypothesis, creating visual representations of data, and proving or disproving the null hypothesis.

Students will work as a pharmaceutical scientist would by testing whether a certain medication for raising glucose levels is more effective at higher doses. They will be given pre-generated test results for ten patients, five high level doses and five normal level doses. They will state their null hypothesis for the experiment. Then students will compare the results using box plots. Students will then explain why or why not they have enough evidence to reject the hypothesis.

Mathematical Practices Used in Unit:

- MP.3 Students will be able to analyze whether a study is a survey experiment or an observational study and will be able to critique the results accordingly.
- MP.2 Students will be able to calculate confidence intervals and margins of error and be able to understand that statistics can help predict outcomes.
- MP.5 Students will be able to use a graphing utility to normalize data.

Unit 8: Equations of Circles and Parabolas *(approximately 11 days)*

STANDARDS
G-C.2, G-C.3, G-C.5, G-GMD.1, G-GPE.1

A. In this unit, students will identify whether a quadratic equation in general form represents a circle by completing the square to get the equation in standard form.

Major Topics:
Changing general form of quadratic equations into standard form
Identify whether the quadratic equations produces a circle or a parabola

B. Unit Assignment(s):
After completing this unit, students will complete a Module Performance Task to determine if a helicopter with a range of 290 nautical miles is in a close enough range to rescue a sailboat off the coast of California. Critical skills includes plotting, on a coordinate plane, the location of LAX and SFO airports along with the location of the sailboat given the latitude and longitude coordinates. Students need to determine which airport should send the rescue helicopter through graphing the equation of the circle circles. Students will justify their reasons and show the evidence in their work for how they came up with their answer.

Mathematical Practices Used in Unit:

- MP.3 Students will construct viable arguments and justify their conclusions when identifying whether a quadratic equation in general form is a circle or a parabola.
- MP.8 Students will use repeated reasoning and algebraic steps when completing the square to change a general form quadratic equation into standard form.

Chapter 2: Functions *(approximately 10 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, A.SSE.3b, A.CED.2, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7a, F.IF.7b, F.IF.8, F.IF.8a, F.BF.1, F.BF.1a, F.BF.1b, F.BF.3, F.BF.4, F.BF.4a, F.BF.4b, F.BF.4c, F.BF.4d, F.LE.2, S.ID.6a, S.ID.6b, S.ID.7

A. In this chapter students will study functions and their graphs, as well as many real-world applications of the functions.

Major Topics:
Graphs of Functions
Average Rate of Change of a Function
Transformations of Functions
Combining Functions
One-to-one Functions and their Inverses

B. Unit Assignment:
After completing Section 2.3, students will give a verbal summary of a situation described by a graph. In this assignment students describe, or tell the story that corresponds to a, given graph as well as make graphs that corresponds to a real-world "story".

Mathematical Practices Used in Ch. 2:

- MP.4: Students will model linear relationships in real world situations and use average rate of change to interpret and quantify the relationship between two variables.
- MP.6. Students will label axes and specify key points to clearly and accurately represent the different type of basic functions such as the linear function, reciprocal function and greatest integer function. Students will also attend to precision for piece-wise functions, ensuring that endpoints are clearly marked and representative of the corresponding domains.
- MP.7: Students will be able to interpret average rate of change within the context of a question and express the significance of the value to the problem. The students will be able to step back and overview transformations of functions as they apply to all types of parent functions and can interpret the structure of functions as a simple transformation on the parent function.

Chapter 3: Polynomials and Rational Functions *(approximately 9 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, A.SSE.3b, A.SSE.3c, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7c, F.IF.7d, F.IF.8b, F.BF.1a

A. In this chapter students will study polynomial and rational functions and their graphs, as well as many real-world applications of the functions.

Major Topics:
Quadratic Functions and Models
Polynomial Functions and Their Graphs
Real Zeros of Polynomials
Complex Zeros and the Fundamental Theorem of Algebra
Rational Functions
Polynomial and Rational Inequalities

B. Unit Assignment:
After completing Section 3.2, students will experience the process of collecting data and then analyzing the data using linear regression. In this assignment students will construct bridges out of paper and use pennies as weights to determine how strong each bridge is. Students will model the data with linear and power functions to determine which model best fits the data. The model will allow students to predict the strength of a large bridge before it is built.

Mathematical Practices Used in Ch. 3:

- MP.2: Students will be able to reason abstractly by understanding the general importance of a power function to the graph of a polynomial. The students will also be able to contextualize the significance of the end behavior and zeros of the function.
- MP.4: Students can model real world situations with fluctuations by using polynomial functions. They can use the properties of polynomial functions to help contextualize the problem.
- MP.7: Students will be able to discern a pattern in the factored form of a polynomial and its relationship to the x-intercepts of a graph. They will also be able to recognize the significance of the power function of the expanded form of a polynomial and the end behavior of the graph.

Semester B

Chapter 4: Exponential and Logarithmic Functions *(approximately 9 days)*

STANDARDS
N.Q.1, N.Q.3, A.SSE.3c, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7e, F.IF.8b, F.BF.5, F.LE.4

A. In this chapter students will study exponential functions where the independent variable is in the exponent. Exponential functions are used in modeling many real-world situations. The inverse function of exponential functions are called logarithmic functions. Once an exponential model has been obtained, students will use the model to predict things such as the size of a population or the growth of an investment.

Major Topics:
Exponential Functions
The Natural Exponential Function
Logarithmic Functions
Laws of Logarithms
Exponential and Logarithmic Equations
Modeling with Exponential Functions
Logarithmic Scales

B. Unit Assignment:
After completing Section 4.3, students will use logarithms or orders of magnitude to compare sizes of objects. It is often difficult to compare objects that vary enormously in size. In this assignment students learn how logarithms can be used to define the concept of "order of magnitude" which provides a simple way of comparison of these objects.

Mathematical Practices Used in Ch. 4:

- MP.2: Students will be able to quantitatively understand the structure of a logarithmic and exponential function separately as well as the inverse relationship of the functions. They will also be able to understand how the key features of a graph are represented in the algebraic expressions.
- MP.4: Students will be able to model a data set by using a linear, quadratic, exponential or logarithmic expression. Students will be able to determine which function best fits the data by identifying key points as well as end behavior.
- MP.5: Students will be able to determine when it is appropriate to use a graphing utility to fit an exponential or logarithmic curve to model a data set.

Chapter 5: Trigonometric Functions: Unit Circle Approach *(approximately 8 days)*

STANDARDS
N.Q.2, N.Q.3, F.IF.8, F.LE.2, F.TF.1, F.TF.2, F.TF.3, F.TF.8, G.SRT.6, G.SRT.7, S.ID.6a

A. In this chapter students will study one way of viewing trigonometric functions, as functions of real numbers. Students will see in this chapter how the trigonometric functions are used to model periodic motion.

Major Topics:
The Unit Circle
Trigonometric Functions of Real Numbers
Trigonometric Graphs
Inverse Trigonometric Functions and Their Graphs
Modeling Harmonic Motion

B. Unit Assignment:
After completing Section 5.3 students will consider an application to biology. In this assignment students will use sine functions to model the population of a predator and its prey. An isolated island is inhabited by two species of mammals: lynx and hares. The lynx are *predators* who feed on the hares, their *prey*. Students will find functions of the form y=asink(t-b)=c that model the lynx and hare populations from a given graph.

Mathematical Practices Used in Ch. 5:

- MP.2: Students will be able to reason abstractly by understanding how the even-odd properties of a trigonometric function is related to the direction of rotation of the angle measure and the quadrant in which the terminal side is drawn.
- MP.5: Students will be able to determine when it is appropriate to use a graphing utility to model periodic phenomena with a sinusoidal function. Students will be able to fit a trigonometric function by identifying the key features of the graph.
- MP.6: Students will be able to clearly define the meaning of the variables in a trigonometric equation by identifying which is an angle and what specific ratio is defined. Students will also be able to accurately label axes according to the expression being graphed, whether the unit circle or a trigonometric function.

Semester B

Chapter 6: Trigonometric Functions: Right Triangle Approach *(approximately 9 days)*

STANDARDS
F.TF.3, F.TF.4, G.SRT.6, G.C.5

A. In this chapter students will study another way of viewing trigonometric functions, as functions of angles. Students will see in this chapter the relationships between angles and distances.

Major Topics:
Angle Measures
Trigonometry of Right Triangles
Trigonometric Functions of Angles
Inverse of Trigonometric Functions and Right Triangles
The Law of Sines
The Law of Cosines

B. Unit Assignment:
After completing Section 6.2 students will investigate how areas and volumes of similar figures change as the size of the figure increases (or decreases). In this assignment students will find power functions that relate these quantities and use those functions to

explore the possibility of the existence of a real-life giant ape. Students will begin by finding some properties of similar figures.

Mathematical Practices Used in Ch. 6:

- MP.1: Students will be able to analyze the given information for an oblique triangle and will persevere in determining the best law (either law of cosines or sines) to solve the triangle. Students will also be able to determine when the ambiguous case for the law of sines applies and will solve for both possible triangles, when necessary.
- MP.3: Students will be able to determine when, for an ambiguous triangle, the second case does or does not work and can create a viable argument as to why.
- MP.4: Students will be able to model real world situations with right and oblique triangles and will be able to use the laws of cosine and sine and the properties of right triangles to determine distances and angles.

Chapter 7: Analytic Trigonometry *(approximately 8 days)*

STANDARDS
N.Q.1, N.Q.2, F.IF.7, F.IF.7e, F.TF.4, F.TF.5, F.TF.7, F.TF.8

A. In this chapter students will study algebraic properties of trigonometric functions. Students will simplify and factor expressions and solve equations that involve trigonometric functions.

Major Topics:
Trigonometric Identities
Addition and Subtraction Formulas
Double-Angle, Half-Angle and Product-Sum Formulas
Basic Trigonometric Equations

B. Unit Assignment:
After completing Section 7.3 students will use trigonometry to find the best location from which to view a painting or a movie. In this assignment, students will use graphing devices and the Law of Cosines to find the best viewing angle possible.

Mathematical Practices Used in Ch. 7:

- MP.1: Students will look for entry points to a trigonometric identity proof and will persevere in looking for relationships to equate the two expressions. Students will analyze the given expressions to determine a solution pathway instead of jumping into a solution attempt.
- MP.2: Students will be able to reason through a trigonometric equation by being able to reason abstractly and seeing a quadratic form that requires factorization. Students will also be able to reason quantitatively by identifying the relationships between the ratios of sides with the corresponding angle measures.

- MP.3: Students will be able to build a logical progression of statements to provide a proof for a trigonometric identity by utilizing the quotient identities, Pythagorean identities, as well as the sum, difference, double- and half-angle formulas.

Chapter 8: Polar Coordinates and Parametric Equations *(approximately 7 days)*

STANDARDS
F.IF.7, F.IF.7e, F.TF.4, F.TF.5, F.TF.8

A. In this chapter students will study a different way of locating points in the plane. Instead of using rectangular coordinates to specify a location, students will give distance and direction from a fixed reference point.

Major Topics:
Polar Coordinates
Graphs of Polar Equations
Polar Form of Complex Numbers: De Moivre's Theorem
Plane Curves and Parametric Equations

B. Unit Assignment:
After completing the chapter, students will use parametric equations and trigonometry to model the path of a projectile in motion. Students will be able to utilize coordinate geometry to realize how changing the angle of projection affects the domain and range of motion.

Mathematical Practices Used in Ch. 8:
- MP.1: Students will be able to visualize the graphing of a complex number as it relates to right triangle trigonometry and how this relationship allows for the conversion between rectangular and polar systems.
- MP.2: Students will be able to relate the roots of a complex number as points equally spaced about a circle and will be able to relate the periodicity of a sinusoidal function to help identify the polar form of the roots.
- MP.3: Students will be able to analyze the relationship between rectangular coordinates and the path of a point moving on a plane to eliminate a parameter and convert between rectangular and parametric equations.

Chapter 9: Vectors in Two and Three Dimensions *(approximately 9 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, F.TF.6, F.TF.7, G.SRT.8, G.SRT.9

A. In this chapter students will be able to represent quantities, such as force, with vectors that are defined by magnitude and direction. Students will also study how several forces acting on an object will affect the movement of that object.

Major Topics:
Vectors in Two Dimensions
The Dot Product
Three-Dimensional Coordinate Geometry
Vectors in Three Dimensions
The Cross Product
Equations of Lines and Planes

B. Unit Assignment:
After completing the chapter, students will use vector fields to model real-world scenarios, like the gravitational force on the earth or wind on the surface of the earth. Students will be able to then analyze the vector fields to identify the center and direction of motion.

Mathematical Practices Used in Ch. 9:

- MP.4: Students will be able to graph vectors in the cartesian system and use the dot product to find the angle between two vectors as well as the direction angles of a vector.
- MP.5: Students will use proper graphing utilities to help them visualize and analyze three-dimensional vectors and cross product vectors.
- MP.6: Students will attend to precision by properly drawing and labeling axes to graph in three dimensions.

Chapter 10: Systems of Equations and Inequalities *(approximately 15 days)*

STANDARDS
N.Q.1-3, N.CN.4, N.CN.5, N.VM.1-5, A.REI.5, N.REI.6, G.SRT.10, G.SRT.11

A. In this chapter, students will use more than two variables to create and solve a system of equations and inequalities. Students will be able to adapt the elimination and substitution methods of solving systems with two variables to now solve systems with three or more variables as well as learning new methods of solving, such as utilizing matrices and Cramer's Rule.

Major Topics:
Systems of Linear Equations in Two Variables
Systems of Linear Equations in Several Variables
Matrices and Systems of Linear Equations
The Algebra of Matrices
Inverses of Matrices and Matrix Equations

Determinants and Cramer's Rule
Partial Fractions
Systems of Nonlinear Equations
Systems of Inequalities

B. Unit Assignment:
After section 10.4, students will use matrix multiplication to project the population proportions of the young, juvenile and adult proportions of a population of animals. Students will use these predictions to analyze the health and growth of the population for the coming seasons in order to understand the long-term prospects of the population.

Mathematical Practices Used in Ch. 10:

- MP.2: Students will analyze a linear system of equations and inequalities and understand that there are multiple methods of solving a system – i.e. substitution, elimination, augmented matrices, Cramer's rule, etc.
- MP.4: Students will understand how to create a matrix to represent data and how matrix operations can be used to analyze the data.
- MP.5: Students will understand how a matrix can be used to represent equations and data and how to algebraically manipulate matrices to solve linear systems.

Chapter 11: Conic Sections *(approximately 9 days)*

STANDARDS
N.VM.7-12, A.REI.7-9, A.REI.12

A. In this chapter, students will understand how conic sections are different cross-sections of a cone. Students will be able to identify the equations of different conics as well as their geometric properties and their graphs.

Major Topics:
Parabolas
Ellipses
Hyperbolas
Shifted Conics
Rotation of Axes
Polar Equations of Conics

B. Unit Assignment:
At the end of the chapter, students will study the use of conics in architecture and how the geometric properties of each conic can create architectural features, such as a whispering gallery. Students will also learn practical methods by which conics could be constructed with by using practical construction tools.

Mathematical Practices Used in Ch. 11:

- MP.1: Students will be able to transform the general form of a conic into the standard form of the respective conic to determine key features.
- MP.2: Students will be able to identify the type of conic from the general form.
- MP.4: Students will be able to model real world situations with the appropriate conic type and use the key features to solve problems.

Chapter 12: Sequences and Series *(approximately 9 days)*

STANDARDS
G.GPE.2, G.GPE.3, G.GMD.4

A. In this chapter, students will study different types of sequences, such as geometric, arithmetic and the Fibonacci sequences and their applications in the real world. Students will be able to recognize, formulate and apply sequences to real world situations as well as being able to evaluate the sum of a series.

Major Topics:
Sequences and Summation Notation
Arithmetic Sequences
Geometric Sequences
Mathematics of Finance
Mathematical Induction
The Binomial Theorem

B. Unit Assignment:
At the end of this chapter, students will be able to apply their knowledge of recursive and explicit formulas of a sequence to analyze and evaluate practical problems, such as a monthly savings account as well as the accumulation of pollutants in the environment. They will be able to predict future values of account balances as well as the percentage of pollutants in the environment after n number of years.

Mathematical Practices Used in Ch. 12:

- MP.5: Students will be able to identify the strengths of using the binomial theorem vs. Pascal's triangle but still understand the complementary relationship between the two.
- MP.7: Students will discern a pattern in a sequence or series and identify whether it is arithmetic or geometric.
- MP8: Students will be able to formulate an explicit and/or recursive formula to represent various sequences and series.

Chapter 13: Limits - A Preview of Calculus *(approximately 8 days)*

STANDARDS
N.CN.8, N.CN.9, A-APR.2, A.APR.3

A. In this chapter, students will understand the definition of one-sided and the overall limit and its applications in calculus, such as finding the instantaneous rate of change as well as the area of a bounded region. Students will understand the laws and the definition of alimit of an average rate of change as the instantaneous speed.

Major Topics:
Finding Limits Numerically and Graphically
Finding Limits Algebraically
Tangent Lines and Derivatives
Limits at Infinity; Limits of Sequences
Areas

B. Unit Assignment:
By the end of the chapter, students will apply their knowledge of finding the area under a curve by finding the total distance of a car traveling for a set amount of time at a designated speed, in miles per hour.

Mathematical Practices Used in Ch. 13:

- MP.2: Students will be able to determine when the limit of a function exists both algebraically and graphically.
- MP.3: Students will be able to justify why the slope of a tangent line must equal 0 at any local maximum or minimum value and its significance.
- MP:6: Students will be able to clearly communicate the conditions for which the limit of a function does and does not exist.

Chapter 14: Probability and Statistics *(approximately 13 days)*

STANDARDS
A.SSE.4, A.APR.5, A.APR.6, A.APR.7, F.IF.3, F.BF.1a, F.BF.2, F.LE.2

A. In this chapter, students will study events that are governed by randomness and have a predictability to them. Students will understand that not all situations can be precisely determined or calculated, but can be analyzed and predicted using probability rules. Students will be able to collect, organize and analyze data using statistical methods, such as the 5-number summary.

Major Topics:
Counting
Probability
Binomial Probability
Expected Value
Descriptive Statistics (Numerical)
Descriptive Statistics (Graphical)
Introduction to Statistical Thinking
Introduction to Inferential Statistics

B. Unit Assignment:
After section 14.6, students will understand how statistics can be used to mislead and misinform. Students will then be able to analyze studies and newspaper articles that quote statistics and identify sources of potential bias.

Mathematical Practices Used in Ch. 14:

- MP.2: Students will be able to use quantitative reasoning to find the probabilities for events, including conditional probability.
- MP.5: Students will be able to use Venn diagrams appropriately to represent the probabilities for the union and intersection of two events as well as for conditional probability. Students will also be able to use a stem and leaf plot to represent data and to find a 5-number summary.
- MP.6 Students will accurately be able to calculate a 5-number summary in order to properly create a visual summary of the statistics, such as a normalized distribution or a box and whisker plot.

Comprehensive Final Exam Details

1. Students will be tested on their knowledge of the following topics:
    - Equations of Circles and Parabolas
    - Prerequisites from Algebra and Geometry
    - Trigonometric Functions
    - Analytic Trigonometry
    - Laws of Sines, Cosines
    - Polar and Vectors
    - Complex Numbers
    - Exponential and Logarithmic Functions
    - Topics in Analytic Geometry, including Conics
    - Functions and Models
    - Limits and Derivatives
    - Differentiation Rules
    - Applications of Differentiation

2. The Final Exams - much like unit/chapter exams - are detail-oriented and require students to provide detailed, step-by-step justification for their responses to each of the questions. This way, they get trained and prepared for their future AP Math courses/exams.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Precalculus (*Formerly Math Analysis)*
Course Code:	*(Educational Services will assign course number **after** Board Approval)*
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated III
Recommended Textbook:	*Precalculus* Josea Eggink, Samantha Falkner, Emily Kaffel, Mark Ray, Jeanne Villeneuve, Karen Wooton, Erin Yao CPM Educational Program Third Edition
Course Overview:	Precalculus meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking.

The course is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson. With the emergence of new technology, many lessons have moved beyond a traditional handheld device and are written with Desmos eTools as an integral component. The curriculum contains several key labs and hands-on activities to introduce and connect concepts, with an emphasis on modeling.

A focus on algebra is woven throughout the course. Students investigate equivalent expressions and practice setting up word problems right from the start. Students use algebra to manipulate inverse, composite, and piecewise-defined functions as well as investigate characteristics of functions and transformations of functions. Students continue rewriting expressions, solving complicated equations and systems, and use algebra to solve word problems. Algebraic manipulation is practiced throughout the rest of the course as students work with limits, rates of change, trigonometric expressions, complex numbers, series, conic sections, and area under the curve.

Careful consideration was given to the sequencing of the concepts in the course to allow for mastery over time while meeting the content standards of a 4th year course. The book is designed to be a year-long course and allows teachers to choose topics that fit the needs of their students. One option using this text is a course that focuses on the 4th year math standards: algebra, functions, trigonometry, complex numbers, conic sections, probability, vectors, and matrices. Another option is a course that focuses on Calculus readiness with topics such as rates of change, limits, and area under the curve.

Course Content:

Semester A

Unit 1: **Preparing for Your Journey** *(approximately 15 days)*

STANDARDS
F.if.4, F.IF.5, F.BF.1, A.CED.1, A.CED.2, F.IF.5, A.SSE.2, A.APR.6, F.BF.1c, F.BF.4, F.IF.7b

A. This unit is designed to accomplish several objectives:

- Introduce students to some of the main concepts that are part of this course.
- Introduce students to the modeling cycle.

- Have students work with functions, including inverse, composite, and piecewise-defined functions.
- Introduce students to radians and the unit circle.

The opening of this unit establishes a starting point for many of the concepts in this course. Interpreting functions and their graphs will be used extensively in the modeling process throughout the course. Solving word problems as well as algebraic manipulation are skills that are necessary throughout the course.

Progression of Content:
Students are introduced to radians and the unit circle early in the course to facilitate work with trigonometric functions in later units. Students review the inverse functions from a previous course. Understanding domain restrictions will be necessary when students learn about the graphs of the inverse trigonometric functions contained in Unit 2 and Unit 8. After reviewing inverse functions, students will investigate composite functions and use them to algebraically determine if two given functions are inverses of each other. Lastly, students define a radian and use radians to measure angles in the unit circle. This is the start of using the unit circle, which trigonometry will be applied to throughout the course. The last lesson in this section examines angular motion vs. linear motion.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 1:

- Students will model with mathematics, attend to precision, look for and make use of structure as they collect data from the Spring Problem
- Students will make sense of problems and persevere in solving them, construct viable arguments and critique the reasoning of others, look for and make use of structure as they work to find the inverse of functions graphically, on a table, and a rule

Sample Activities:
The Spring Problem - Students engage with a notice and wonder through this activity as they conduct a lab using a spring with a weight attached at the end. In order to gather data from this activity, students video record the motion of the spring and weight in order to make a table and graph the results. Finally, students use the their model to make various predictions of the position of the wight at different times.

The Inverse of Function - Students will review how to write an inverse function by "undoing" and learn how to algebraically verify that functions are inverses. Students will see the inverse of a function graphically, on a table, and through its rule.

Unit 2: **Functions and Trigonometry** *(approximately 14 days)*

STANDARDS
F.IF.4, F.IF.7, F.BF.3, F.TF.3, F.TF.4, F.IF.7e, F.TF.2, A.REI.10, F.TF.6

A. This unit is designed to accomplish several objectives:

- Describe graphs as increasing/decreasing, concave up/concave down, and state the location(s) of maxima and minima.
- Identify graphs of functions as even, odd, or neither. Or, given the equation of a function, algebraically show that the function is even, odd, or neither.
- Develop fluency with angles and coordinates in the unit circle.
- Generate the parent graphs for sine and cosine and use them in a variety of transformations.
- Generate the parent graphs for inverse sine, inverse cosine, tangent, and inverse tangent.
- Solve basic trigonometric equations over specified domains.

In the first section of this unit, students will review attributes used to describe functions. Concavity will be introduced and students will use algebra to show that functions are even, odd, or neither. Then transformations of functions will be investigated. Again, much of this will be review from a previous course, but will now include horizontal stretches.

In Unit 1, students were introduced to radians and the unit circle. They have practiced a number of problems to reinforce key angle measurements and have worked with special triangles to develop ratios for 45º-45º-90º and 30º-60º-90º triangles. Now they will use these ideas to generate the key coordinates in the unit circle and develop the graphs of sine and cosine.

The second section is devoted to the development of sine and cosine from the standpoint of the unit circle. Students first locate the coordinates for the special angles they used in Unit 1. They then see that the sine ratio corresponds to the y-coordinate and the cosine ratio corresponds to the x-coordinate. Using these values, students develop the Pythagorean Identity. From here, students will graph $y = \sin(q)$ and $y = \cos(q)$ using the unit circle. The section continues with transformations of the graphs of sine and cosine.

In the last section, students begin by solving trigonometric equations. Here students will see that these equations can have multiple, and even an infinite number of, solutions. They will use graphs and the unit circle to generate the solutions to these equations. Students will then use $y = \sin^{-1}(x)$ and $y = \cos^{-1}(x)$ to solve for angles which are not the special angles in the unit circle. Finally, students generate the graphs of inverse sine, inverse cosine, tangent, and inverse tangent.

Progression of Content:
In this unit, students work with transformations of sine and cosine and applied these transformations to a few applications. Then in Unit 8, students extend their work with trigonometric functions to more complex situations; model situations with sinusoidal functions that have both a horizontal shift and a period other than 2π; graph and apply the reciprocal trigonometric functions; develop other trigonometric tools for simplifying expressions using formulas involving sums of angles.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 2:

- Look for and make use of structure, reason abstractly and quantitatively.
- Use appropriate tools strategically, look for and make use of structure, look for and express regularity in repeated reasoning.
- Construct viable arguments and critique the reasoning of others, look for and make use of structure, look for and express regularity in repeated reasoning.
- Use appropriate tools strategically, attend to precision.
- Make sense of problems and persevere in solving them, use appropriate tools strategically, attend to precision, look for and make use of structure.

Sample Activities:
The Unit Circle - Students determine the coordinates of the intersection of the terminal side of a special angle with the unit circle. Students will cut out two special right triangles from a resource page. Sides of the special triangles will be labeled using the exact values on both sides of the paper. This will ensure that the labels are shown when the triangles are flipped over. By placing each of the special right triangles on the x-axis, students will be able to find the coordinates of each of the special angles and repeat the process in all four quadrants to complete the unit circle.

Solving Trigonometric Equations - To solve an equation such as sin x =12, students are directed to draw a unit circle and also graph y = 12, which is a horizontal line. The intersections of the unit circle and the horizontal line will show students the solutions as well as number of solutions. By treating this problem as a system of equations, students are made aware of the connections the solutions are graphically and algebraically. In the same problem, students are asked how many more solutions there could be if we were allowed to continue to revolve around the circle. Eventually the next time students come across this type of problem, they will know to convert the unit circle into a sinusoidal graph and will see the horizontal line having multiple intersections with the sinusoidal graph to help them find all solutions.

Unit 3: **Algebra and Area Under the Curve** *(approximately 11 days)*

STANDARDS
A.APR.6, A.APR.7, A.SSE.2, A.REI.7, A.REI.11, F.BF.1, A.CED.1

A. In Unit 3, students begin by practicing and strengthening their algebraic manipulation skills as they continue to write equivalent rational expressions and complex fractions. Students learn how substitution can help solve equations and systems of equations. Students then finish up this unit by solving a series of word problems using their algebra skills.

   Another focus of this unit is approximating the area under a curve using summation notation. This concept is one of the major themes of calculus. The goal is to understand what area under a curve can represent and how to approximate it using rectangles.

Progression of Content:
Area under a curve is one of the main ideas in calculus. In this unit, students will be taught background information that will provide a deeper understanding of integration in calculus. The goal in this section is for students to understand the meaning of area under a curve.

B. Unit Assignment(s):
Mathematical Practices used in Unit 3:

- Students will make sense of problems and persevere in solving them, look for and make use of structure, construct viable arguments and critique the reasoning of others as they add, subtract, multiply, and divide rational expressions.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, reason abstractly and quantitatively as they calculate sums by expanding sigma notation as well as write finite arithmetic series in sigma notation.

Sample Activities:
Growth Mindset (Jo Boaler) - In the first lesson of this unit, teachers are encouraged and given the tools to discuss the concepts of the importance of everyone, especially students, learning from their mistakes through error analysis and dendrite growth.

Unit 4: **Polynomial and Rational Functions** *(approximately 14 days)*

STANDARDS
F.IF.7c, A.APR.3, F.IF.4, N.CN.8, N.CN.9, A.APR.6, F.IF.7d, A.CED.1, A.CED.2

A. In this unit, students will apply their knowledge of families of functions to include polynomial and rational functions. Students will investigate the equation ↔ graph connection for these two families of functions, and learn to describe the end behavior of a function. In the first section, students will learn to graph polynomial functions from the factored forms or their equations.

Students will then work backwards, using graphs to write equations in factored form. Finally, students will learn how to identify all of the roots of a polynomial. Second section begins with a new method for rewriting equations of rational functions is introduced in this section. Students will practice graphing transformations of rational functions. Then students will investigate rational functions that have slant asymptotes and holes.

Finally, students will extend your knowledge of rational functions to graph reciprocal functions. In the last section of the chapter, students will apply what students have learned to solve polynomials and rational equations and inequalities. Finally, students will apply their knowledge of polynomial and rational functions to model and analyze everyday situations.

Progression of Content:
In calculus, polynomials are used to approximate complicated functions because they "behave nicely" and are easy to work with.

B. Unit Assignment(s):
Mathematical Practices used in Unit 4:

- Students will look for and make use of structure, construct viable arguments and critique the reasoning of others as they graph polynomial functions from equations given in factored form.
- Students will look for and make use of structure as they rewrite rational expressions to transform functions in the form $g(x) = \frac{ax+b}{x-c}$ into transformations of $y = \frac{1}{x-h} + k$.
- Students will look for and make use of structure, construct viable arguments and critique the reasoning of others as they solve polynomial and rational inequalities.

Sample Activities:
Polynomial Function Investigation - Students will investigate the graphs of polynomial functions in factored form. Use different numbers of factors with different values of the parameters will show how it will change the graph. Sample of an equation in which students need to change the parameters would is as follows: n(x)=x-a(x-b)(x-c) in which a, b, and c will be different values. Students will have a chance to compare their graphs with their teammates to see the behavior of different types of equations without having to do all of them themselves.

Unit 5: **Exponentials and Logarithms** *(approximately 14 days)*

STANDARDS
A.CED.2, F.IF.7e, F.LE.2, F.BF.5, F.LE.4

A. The start of this unit focuses on exponential functions. Students will apply what they already know about exponential functions to everyday situations. Students will then realize that sometimes two different transformations give the same result, mainly that every exponential function with a horizontal shift is equivalent to a vertical stretch. This shows graphically, as well as algebraically, that every function of the form y = a(bx–h) + k is equivalent to y = A(bx) + k. Furthermore, students will learn about the number e.

In the second half of this unit, students will review, use, and prove the properties of logarithms, each of which corresponds to a property of exponents. Students will also continue solving equations and simplifying expressions that involve logarithms and exponents. This unit is culminated through graphing the family of logarithmic functions and solving application problems.

Progression of Content:
This unit on exponential and logarithmic functions culminates students' engagement in this 4th year course.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 5:

- Students will make sense of problems and persevere in solving them, reason abstractly and quantitatively, model with mathematics, look for and make use of structure as they use exponential functions to model everyday situations
- Students will look for and make use of structure as they understand that for exponential functions, a horizontal shift can be equivalently written as a vertical stretch.
- Students will look for and make use of structure, use appropriate tools strategically, look for and express regularity in repeated reasoning as they practice converting between exponential and logarithmic equations, and investigate the basic properties of logarithms, including natural logarithms.

Sample Activities:
The number *e* - In this activity, students explore what occurs when1 cm2of bacteria reproduces at 100% rate every hour, every minute, every second, and finally every millisecond for one day. A follow up question to this activity is, "What happens to the bacteria if it reproduces *continuously*?" Students will recognize that the base of their exponential model is getting closer and closer to the number *e* and the continuous compound formula A(t)=Pert.

Proving the Logarithmic Properties Card Sort:
In this activity, students prove the Product Property of Logarithms using a card sort. Each team obtains one set of cards. Students arrange the cards in the center of their team's workspace so that everyone can participate. Students then arrange the cards in a logical manner and provide justification for each part of their proof. Justifications can be written on sticky notes or blank cards so that they are easily moved as well. The teacher verifies that each team has the correct proof before allowing them to move on. Students prove the Quotient and Power Properties in a similar format.

Semester B

Unit 6: **Triangles and Vectors** *(approximately 15 days)*

STANDARDS
G.SRT.9, G.SRT.10, G.SRT.11, N.VM.1, N.VM.2, N.VM.4, N.VM.5, N.VM.3

A. Two useful tools for solving situational problems are triangles and vectors. Many everyday situations involve triangles, so students will need to be able to solve any triangle with minimal given information. In first section, students will develop and use the Law of Sines and the Law of Cosines to solve non-right triangles. Students will

learn to solve triangles when the given information does not create one unique triangle. In the second section, students will learn how to use vectors to describe motion; complete vector operations both graphically and algebraically; apply your knowledge of vectors to solve everyday problems.

Progression of Content:
Students are reintroduced to Law of Sines and Law of Cosines and their applications. But this will most likely be the last time students see a formal lesson on these topics. As for the lessons on vector, since this is a the first introduction to the topic, students who pursue higher math and science course will encounter them again.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 6:

- Students will look for and make use of structure as they prove, understand, and apply the Law of Sines and Law of Cosines. They will also derive the formula $A = 1/2ab\sin(C)$ for the area of a triangle.
- Students will look for and make use of structure, attend to precision, use appropriate tools strategically as they are introduced to vectors and vector notation. They will determine magnitude, direction, and/or components of a vector.
- Students will make sense of problems and persevere in solving them, attend to precision, reason abstractly and quantitatively, model with mathematics, use appropriate tools strategically as they use vectors in real world applications.

Sample Activity:
Vector Line Dance - The Vector Line Dance has students perform a series of moves in the form of a line dance. The idea is that all of the students are doing the same movements but from different starting positions. The starting position does not matter when working with vectors. This activity is "self correcting" in that students should notice if they make a mistake in their direction or distance, since students should move in unison (similar to line dancing). Once students have completed the activity, the class can discuss the idea of everyone making the same motion (steps and direction), but from different positions. This develops the notion that a vector has a direction and length (magnitude).

Unit 8: **Extending Periodic Functions** *(approximately 16 days)*

STANDARDS
F.BF.3, F.TF.7, A.CED.2, F.TF.9, F.TF.10

A. In Unit 2, students worked with transformations of sine and cosine and applied these transformations to a few applications. This unit extends their work with trigonometric functions to more complex situations. Students will model situations with sinusoidal functions that have both a horizontal shift and a period other than 2π. Students will graph and apply the reciprocal trigonometric functions. You will also develop other

trigonometric tools for simplifying expressions using formulas involving sums of angles.

Progression of Content:
In Calculus, students will be using trigonometric functions to find derivatives and find integrals.

B. Unit Assignment(s):
Mathematical Practices used in Unit 8:

- Students will look for and make use of structure as they combine a horizontal stretch and shift of the same trigonometric function and set up a modeling problem.
- Students will model with mathematics as they generate trigonometric models for real-world applications.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, use appropriate tools strategically as they graph $y = \csc(x)$, $y = \sec(x)$, and $y = \cot(x)$; prove trigonometric identities.
- Students will use appropriate tools strategically as they use geometry to visualize the trigonometric functions.

Sample Activity:
Graphing Reciprocal Trigonometric Functions - Students will use the graphs of sine, cosine, and tangent to graph their respective reciprocal functions cosecant, secant, and cotangent. Students are encouraged to use the symmetry of the graph to save themselves time. For example, once they have values for sine and cosecant between $x = 0$ and $x = \pi$, they can use the same values (but negative) between $x = \pi$ and $x = 2\pi$. Students will see that the x-intercepts of $y = \sin(x)$ become the locations of the asymptotes for its reciprocal function. These asymptotes should help students identify the domain and asymptotes for the reciprocal functions.

Unit 9: **Matrices** *(approximately 13 days)*

STANDARDS
N.VM.6, N.VM.7, N.VM.8, N.VM.9, N.VM.10, N.VM 11, N.VM.12, A.REI.8, A.REI.9

A. In this unit, students learn what a matrix is and how matrices, along with a graphing calculator, can be useful tools for organizing data and solving problems. Students then use matrices to solve complicated systems of equations.

   By the second half of the unit, students understand the definition of a linear transformations and relate linear transformations to matrices. Students then investigate compositions of transformations and see how transformations affect geometric figures.

Progression of Content:
This unit is an introduction to matrices, the topic of a Linear Algebra course (usually taken after Calculus) in college. Matrices are also included in college Business Math courses.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 9:

- Students will look for and make use of structure, make sense of problems and persevere in solving them as they add, subtract, and start to multiply matrices.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, make sense of problems and persevere in solving them, use appropriate tools strategically as they multiply a vector (regarded as a matrix with one row/column) by a matrix of suitable dimensions to produce another vector, and use matrix multiplication to solve problems.
- Students will reason abstractly and quantitatively, look for and make use of structure as they perform linear transformations using matrices.

Sample Activity:
The Toy Factory - Students learn to use matrices to represent linear situations that involve several variables needed to make two types of toys, cars and trucks requiring different amount of wheels, seats, and different costs to manufacture each type of toy. The goal of the activity is for students to determine whether or not a particular request from a buyer can be fulfilled.

Unit 10: **Conics and Parametric Functions** *(approximately 15 days)*

STANDARDS
G.GPE.3.1, F.IF.10

A. In this unit, students will analyze shapes that result from slicing a cone with a plane. These shapes are called conic section. In the first section, students will look at circles, ellipses, hyperbolas, and parabolas. They will generate the conics and derive their equations using the formal definitions. Students will recognize conic sections from their equations and complete the square to rewrite the equations in graphing form. Second section focuses on parametrically-defined functions. Students are introduced to the concept of defining x and y in terms of the parameter t. They will see how parametrically-defined functions can be used to model situations involving motion. The final lesson in this section has students solve problems using projectile motion. This is much more powerful than the past work students have completed with parabolas.

Progression of Content:
In calculus, a chapter is devoted to developing calculus tools for other forms of equations: polar, parametric, and vector.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 10:

- Students will look for and make use of structure, reason abstractly and quantitatively, use appropriate tools strategically, attend to precision as they derive the equation of a circle and practice completing the square, derive the equation of a hyperbola and ellipse, rewrite parametric equations representing conic sections in rectangular form, apply their knowledge of parametric equations to everyday situations.

Sample Activities:
Where is the Center - Students are reintroduced to algebra tiles which they have used in previous course to rewrite quadratic equation into perfect square forms to solve them. Now they will use algebra tiles to complete the square on both x and y variables which will help in rewrite conic section equations into graphing form. The use of the manipulatives allows students, especially those unfamiliar with completing the square or that lack the experience with algebra tiles to get a full understanding as to why it is called completing the square. Once equations of a circle in this problem are rewritten in this form, students can easily identify the center of the circle.

Flick a Coin - This demonstrates how vertical motion is not affected by horizontal motion. To do this, one coin is flicked while the other coin is dropped. The teacher will need to do a demonstration for the whole class. Fold the 3" × 5" index card in half lengthwise, then fold each half (again lengthwise) in the opposite direction. Squeeze the two middle parts together with your thumb and forefinger creating a T when viewed at the end. Turn the folded index card so that the T is upside down. Lay the upside-down T on a table and place a coin on either side of the vertical center. The coins should be laid flat, resting against the center of the T, and near the end. Pinch and hold the side opposite of the coins. Slide the card so that the coins and half of the card extend beyond the edge of a flat surface. Now, imagine that this is a pinball machine flipper and quickly flick your wrist. One coin will be projected forward while the other falls straight down. Listen carefully for the sounds as they hit the floor. One sound means they hit at approximately the same time. Theoretically, the two coins should hit the ground at the same time, even though the first coin travels a longer path. This is true because the horizontal and vertical motions are independent.

Unit 11: **Polar Functions and Complex Numbers** *(approximately 15 days)*

STANDARDS
F.IF.11, N.CN.3, N.CN.4, N.CN.5, N.CN.6

A. In this unit, students transition from graphing rectangular coordinates (x, y), to polar coordinates, which use a distance and an angle. Students will then apply their work with polar coordinates to the world of complex numbers. They will graph complex numbers and learn to rewrite them in polar form. Furthermore, students will also perform operations with complex numbers in polar form, including multiplying, dividing, and computing powers and roots. This unit culminates with students

learning to plot points and graph equations using a radius and an angle, and make conversions between polar and rectangular equations

Progression of Content:
It is not until the second year of Calculus that students revisit polar functions through integration and differentiation.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 11:

- Students will look for and make use of structure, look for and express regularity in repeated reasoning as they graph polar functions, explore various polar functions, graph complex numbers.
- Students will look for and make use of structure as they convert between polar and rectangular forms.
- Students will look for and make use of structure, use appropriate tools strategically as they represent operations with complex numbers geometrically, and use conjugates to determine moduli and quotients of complex numbers.

Sample Activity:
Polar Coordinates Battleship - Directions/rules for the students are as follows:

- Mark your ships on your polar grid. Each ship must be connected to another ship, either along a ray or around a circle.
- Take turns firing out shots. Each target should be stated in four ways: positive radius and positive angle (+, +), positive radius and negative angle (+, −), negative radius and positive angle (−, +), and negative radius and negative angle (−, −). Both players should record the shots on the charts for further reference.
- If you are the opponent, verify that all of the targets stated are the same location. If not, the player forfeits their turn.
- If the shots miss a ship, the opponent declares "miss" and both players place an open circle in the appropriate location. If the shots hit a ship, the opponent declares "hit" and both players mark an X in the appropriate location.
- You must state when a ship is sunk completely.
- The goal is to sink all of your opponent's ships.

Unit 12: **Series and Statistics** *(approximately 15 days)*

STANDARDS
A.SSE.2, A.SSE.4, A.APR.5, S.MD.1, S.MD.2, S.MD.3, S.MD.4, S.MD.5

A. In this unit students will begin by calculating the sums of series. Students will derive formulas for and evaluate the sums of arithmetic and geometric series. Students will use limits to evaluate sums of infinite geometric series. At the end of this section students' skills will be applied to analyze some common situations. Second section

begins by looking for patterns in the expansion of (x + y)n and relates the patterns to Pascal's triangle. This leads the use of the Binomial Theorem for the expansion of binomials of the form (a + b)n, where n is a positive integer. Students then apply the patterns from the first lesson of this section to compute probabilities for binomial experiments. In the last section, students will understand what a discrete random variable is as well as the difference between frequency and relative frequency. They will create relative frequency tables for discrete random variables and graph probability distributions as relative frequency histograms. The section continues with calculating the mean and expected value of a discrete random variable. Once students understand these values and how to calculate them, they use these values to make decisions for everyday situations.

Progression of Content:
In Calculus, students will learn tests for determining convergence or divergence of infinite series. And students will learn basic tools if they do decide to move onto a statistical course.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 12:

- Students will look for and make use of structure, look for and express regularity in repeated reasoning, reason abstractly and quantitatively, use appropriate tools strategically as they develop a formula for the sum of an arithmetic series.
- Students will use appropriate tools strategically, look for and make use of structure, reason abstractly and quantitatively as they use limits to determine the sum for infinite geometric series.
- Students will make sense of problems and persevere in solving them, use appropriate tools strategically as they apply their knowledge of sums of geometric series to solve problems involving everyday situations and develop the concept of a random variable for discrete random variables. They will graph probability distributions associated with random variables. They will calculate and interpret the mean and expected value of a discrete random variable.

Sample Activity:
Quebare - This problem is launched by showing short video for the "game" they are about to play. For the purpose of this problem, Quebare's moves have been restricted to down left and down right. Students are instructed to discuss strategies for determining the exact number of paths to each block. Using isometric dot paper, plastic sleeves, and dry erase pens. Students can then use the resources to test their strategies. Students may or may not notice at this point that they have seen this pattern before. If they recognize it as Pascal's triangle, allow them to share this with the class. Otherwise, let them continue to work the patterns; the paragraph at the end of the lesson addresses the name and significance of the pattern.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Precalculus Honors (*Formerly Honors Math Analysis)*
Course Code:	*(Educational Services will assign course number **after** Board Approval)*
School(s) Course Offered:	Clark Magnet High School, Crescenta Valley High School, Hoover High School, Verdugo Academy
UC/CSU Approved (Y/N, Subject):	Y, mathematics "c"
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated III
Recommended Textbook:	*Precalculus: Mathematics for Calculus* James Stewart, Lothar Redlin, Saleem Watson Cengage Learning Seventh Edition
Course Overview:	Precalculus is a 4th year high school mathematics course to solidify and explore deeper concepts and content that students have seen before as well as introducing some new concepts to help prepare them for more advanced mathematics. This course meets all the Common Core state standards for a fourth-year of high school mathematics and is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson and chapter.

This courses covers the same material as Precalculus and adds rates of change, limits and area under the curve.

Course Content:

Semester A

Chapter 1: Fundamentals *(approximately 15 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, N.CN.7, A.SSE.3a, A.CED.1, A.CED.2, A.CED.3, A.CED.4, A.REI.2, A.REI.3, A.REI.4, A.RED.4a, A.REI.4b, F.IF.1, F.IF.2, F.IF.4, F.IF.5, F.IF.7, F.IF.7b, F.IF.8, G.GPE.1, G.GPE.5, G.GPE.6, G.GPE.7

A. In the first chapter, students will review the real numbers, equations and the coordinate plane. Students will get a fresh look at these review concepts by applying them to real world problems.

Major Topics:
Real numbers
Exponential, radical and rational expressions
Complex numbers
Inequalities
Lines, circles

B. Unit Assignment:
After completing section 1.12, students will use their understanding of proportionality to determine how a frog's size relates to its sensitivity to pollutants in the environment. They will explore how animals, of the same body type, will have a skin area and volume that are proportional to the length of their body. The students will be able to calculate proportionality according to body length, weight, surface skin area, and volume.

Mathematical Practices Used in Ch. 1:

- MP.1: Students will explain to themselves the meaning of a problem and look for entry points to its solution. They analyze givens, constraints, relationships and goals for modeling questions regarding inequalities and proportions. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt.
- MP.2: Students make sense of quantities and their relationships in problem situations. They are able to abstract a given situation and represent the relationship between two variables symbolically, as in direct and indirect variation.
- MP.3: Students learn how to use stated assumptions, definitions and previously established results in constructing arguments and equations to represent real

world situations. They will utilize the distance*rate=time equation and proportional relationships to analyze situations that take into account the context of each question.

Chapter 2: Functions *(approximately 11 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, A.SSE.3b, A.CED.2, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7a, F.IF.7b, F.IF.8, F.IF.8a, F.BF.1, F.BF.1a, F.BF.1b, F.BF.3, F.BF.4, F.BF.4a, F.BF.4b, F.BF.4c, F.BF.4d, F.LE.2, S.ID.6a, S.ID.6b, S.ID.7

A. In this chapter students will study functions and their graphs, as well as many real-world applications of the functions.

Major Topics:
Graphs of Functions
Average Rate of Change of a Function
Transformations of Functions
Combining Functions
One-to-one Functions and their Inverses

B. Unit Assignment:
After completing Section 2.3, students will give a verbal summary of a situation described by a graph. In this assignment students describe, or tell the story that corresponds to a, given graph as well as make graphs that corresponds to a real-world "story".

Mathematical Practices Used in Ch. 2:

- MP.4: Students will model linear relationships in real world situations and use average rate of change to interpret and quantify the relationship between two variables.
- MP.6. Students will label axes and specify key points to clearly and accurately represent the different type of basic functions such as the linear function, reciprocal function and greatest integer function. Students will also attend to precision for piece-wise functions, ensuring that endpoints are clearly marked and representative of the corresponding domains.
- MP.7: Students will be able to interpret average rate of change within the context of a question and express the significance of the value to the problem. The students will be able to step back and overview transformations of functions as they apply to all types of parent functions and can interpret the structure of functions as a simple transformation on the parent function.

Chapter 3: Polynomials and Rational Functions *(approximately 10 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, A.SSE.3b, A.SSE.3c, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7c, F.IF.7d, F.IF.8b, F.BF.1a

A. In this chapter students will study polynomial and rational functions and their graphs, as well as many real-world applications of the functions.

Major Topics:
Quadratic Functions and Models
Polynomial Functions and Their Graphs
Real Zeros of Polynomials
Complex Zeros and the Fundamental Theorem of Algebra
Rational Functions
Polynomial and Rational Inequalities

B. Unit Assignment:
After completing Section 3.2, students will experience the process of collecting data and then analyzing the data using linear regression. In this assignment students will construct bridges out of paper and use pennies as weights to determine how strong each bridge is. Students will model the data with linear and power functions to determine which model best fits the data. The model will allow students to predict the strength of a large bridge before it is built.

Mathematical Practices Used in Ch. 3:

- MP.2: Students will be able to reason abstractly by understanding the general importance of a power function to the graph of a polynomial. The students will also be able to contextualize the significance of the end behavior and zeros of the function.
- MP.4: Students can model real world situations with fluctuations by using polynomial functions. They can use the properties of polynomial functions to help contextualize the problem.
- MP.7: Students will be able to discern a pattern in the factored form of a polynomial and its relationship to the x-intercepts of a graph. They will also be able to recognize the significance of the power function of the expanded form of a polynomial and the end behavior of the graph.

Chapter 4: Exponential and Logarithmic Functions *(approximately 10 days)*

STANDARDS
N.Q.1, N.Q.3, A.SSE.3c, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7e, F.IF.8b, F.BF.5, F.LE.4

A. In this chapter students will study exponential functions where the independent variable is in the exponent. Exponential functions are used in modeling many real-world situations. The inverse function of exponential functions are called logarithmic functions. Once an exponential model has been obtained, students will use the model to predict things such as the size of a population or the growth of an investment.

Major Topics:
Exponential Functions
The Natural Exponential Function
Logarithmic Functions
Laws of Logarithms
Exponential and Logarithmic Equations
Modeling with Exponential Functions
Logarithmic Scales

B. Unit Assignment:
After completing Section 4.3, students will use logarithms or orders of magnitude to compare sizes of objects. It is often difficult to compare objects that vary enormously in size. In this assignment students learn how logarithms can be used to define the concept of "order of magnitude" which provides a simple way of comparison of these objects.

Mathematical Practices Used in Ch. 4:

- MP.2: Students will be able to quantitatively understand the structure of a logarithmic and exponential function separately as well as the inverse relationship of the functions. They will also be able to understand how the key features of a graph are represented in the algebraic expressions.
- MP.4: Students will be able to model a data set by using a linear, quadratic, exponential or logarithmic expression. Students will be able to determine which function best fits the data by identifying key points as well as end behavior.
- MP.5: Students will be able to determine when it is appropriate to use a graphing utility to fit an exponential or logarithmic curve to model a data set.

Chapter 5: Trigonometric Functions: Unit Circle Approach *(approximately 9 days)*

STANDARDS
N.Q.2, N.Q.3, F.IF.8, F.LE.2, F.TF.1, F.TF.2, F.TF.3, F.TF.8, G.SRT.6, G.SRT.7, S.ID.6a

A. In this chapter students will study one way of viewing trigonometric functions, as functions of real numbers. Students will see in this chapter how the trigonometric functions are used to model periodic motion.

Major Topics:
The Unit Circle
Trigonometric Functions of Real Numbers
Trigonometric Graphs
Inverse Trigonometric Functions and Their Graphs
Modeling Harmonic Motion

B. Unit Assignment:
After completing Section 5.3 students will consider an application to biology. In this assignment students will use sine functions to model the population of a predator and its prey. An isolated island is inhabited by two species of mammals: lynx and hares. The lynx are *predators* who feed on the hares, their *prey*. Students will find functions of the form y=asink(t-b)=c that model the lynx and hare populations from a given graph.

Mathematical Practices Used in Ch. 5:

- MP.2: Students will be able to reason abstractly by understanding how the even-odd properties of a trigonometric function is related to the direction of rotation of the angle measure and the quadrant in which the terminal side is drawn.
- MP.5: Students will be able to determine when it is appropriate to use a graphing utility to model periodic phenomena with a sinusoidal function. Students will be able to fit a trigonometric function by identifying the key features of the graph.
- MP.6: Students will be able to clearly define the meaning of the variables in a trigonometric equation by identifying which is an angle and what specific ratio is defined. Students will also be able to accurately label axes according to the expression being graphed, whether the unit circle or a trigonometric function.

Chapter 6: Trigonometric Functions: Right Triangle Approach *(approximately 9 days)*

STANDARDS
F.TF.3, F.TF.4, G.SRT.6, G.C.5

A. In this chapter students will study another way of viewing trigonometric functions, as functions of angles. Students will see in this chapter the relationships between angles and distances.

Major Topics:
Angle Measures
Trigonometry of Right Triangles
Trigonometric Functions of Angles
Inverse of Trigonometric Functions and Right Triangles
The Law of Sines
The Law of Cosines

B. Unit Assignment:
After completing Section 6.2 students will investigate how areas and volumes of similar figures change as the size of the figure increases (or decreases). In this assignment students will find power functions that relate these quantities and use those functions to explore the possibility of the existence of a real-life giant ape. Students will begin by finding some properties of similar figures.

Mathematical Practices Used in Ch. 6:

- MP.1: Students will be able to analyze the given information for an oblique triangle and will persevere in determining the best law (either law of cosines or sines) to solve the triangle. Students will also be able to determine when the ambiguous case for the law of sines applies and will solve for both possible triangles, when necessary.
- MP.3: Students will be able to determine when, for an ambiguous triangle, the second case does or does not work and can create a viable argument as to why.
- MP.4: Students will be able to model real world situations with right and oblique triangles and will be able to use the laws of cosine and sine and the properties of right triangles to determine distances and angles.

Chapter 7: Analytic Trigonometry *(approximately 8 days)*

STANDARDS
N.Q.1, N.Q.2, F.IF.7, F.IF.7e, F.TF.4, F.TF.5, F.TF.7, F.TF.8

A. In this chapter students will study algebraic properties of trigonometric functions. Students will simplify and factor expressions and solve equations that involve trigonometric functions.

Major Topics:
Trigonometric Identities
Addition and Subtraction Formulas
Double-Angle, Half-Angle and Product-Sum Formulas
Basic Trigonometric Equations

B. Unit Assignment:
After completing Section 7.3 students will use trigonometry to find the best location from which to view a painting or a movie. In this assignment, students will use graphing devices and the Law of Cosines to find the best viewing angle possible.

Mathematical Practices Used in Ch. 7:

- MP.1: Students will look for entry points to a trigonometric identity proof and will persevere in looking for relationships to equate the two expressions. Students will

analyze the given expressions to determine a solution pathway instead of jumping into a solution attempt.

- MP.2: Students will be able to reason through a trigonometric equation by being able to reason abstractly and seeing a quadratic form that requires factorization. Students will also be able to reason quantitatively by identifying the relationships between the ratios of sides with the corresponding angle measures.
- MP.3: Students will be able to build a logical progression of statements to provide a proof for a trigonometric identity by utilizing the quotient identities, Pythagorean identities, as well as the sum, difference, double- and half-angle formulas.

Semester B

Chapter 8: Polar Coordinates and Parametric Equations *(approximately 7 days)*

STANDARDS
F.IF.7, F.IF.7e, F.TF.4, F.TF.5, F.TF.8

A. In this chapter students will study a different way of locating points in the plane. Instead of using rectangular coordinates to specify a location, students will give distance and direction from a fixed reference point.

Major Topics:
Polar Coordinates
Graphs of Polar Equations
Polar Form of Complex Numbers: De Moivre's Theorem
Plane Curves and Parametric Equations

B. Unit Assignment:
After completing the chapter, students will use parametric equations and trigonometry to model the path of a projectile in motion. Students will be able to utilize coordinate geometry to realize how changing the angle of projection affects the domain and range of motion.

Mathematical Practices used in Ch. 8:

- MP.1: Students will be able to visualize the graphing of a complex number as it relates to right triangle trigonometry and how this relationship allows for the conversion between rectangular and polar systems.
- MP.2: Students will be able to relate the roots of a complex number as points equally spaced about a circle and will be able to relate the periodicity of a sinusoidal function to help identify the polar form of the roots.

- MP.3: Students will be able to analyze the relationship between rectangular coordinates and the path of a point moving on a plane to eliminate a parameter and convert between rectangular and parametric equations.

Chapter 9: Vectors in Two and Three Dimensions *(approximately 9 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, F.TF.6, F.TF.7, G.SRT.8, G.SRT.9

A. In this chapter students will be able to represent quantities, such as force, with vectors that are defined by magnitude and direction. Students will also study how several forces acting on an object will affect the movement of that object.

Major Topics:
Vectors in Two Dimensions
The Dot Product
Three-Dimensional Coordinate Geometry
Vectors in Three Dimensions
The Cross Product
Equations of Lines and Planes

B. Unit Assignment:
After completing the chapter, students will use vector fields to model real-world scenarios, like the gravitational force on the earth or wind on the surface of the earth. Students will be able to then analyze the vector fields to identify the center and direction of motion.

Mathematical Practices Used in Ch. 9:
- MP.4: Students will be able to graph vectors in the cartesian system and use the dot product to find the angle between two vectors as well as the direction angles of a vector.
- MP.5: Students will use proper graphing utilities to help them visualize and analyze three-dimensional vectors and cross product vectors.
- MP.6: Students will attend to precision by properly drawing and labeling axes to graph in three dimensions.

Chapter 10: Systems of Equations and Inequalities *(approximately 15 days)*

STANDARDS
N.Q.1-3, N.CN.4, N.CN.5, N.VM.1-5, A.REI.5, N.REI.6, G.SRT.10, G.SRT.11

A. In this chapter, students will use more than two variables to create and solve a system of equations and inequalities. Students will be able to adapt the elimination and

substitution methods of solving systems with two variables to now solve systems with three or more variables as well as learning new methods of solving, such as utilizing matrices and Cramer's Rule.

Major Topics:
Systems of Linear Equations in Two Variables
Systems of Linear Equations in Several Variables
Matrices and Systems of Linear Equations
The Algebra of Matrices
Inverses of Matrices and Matrix Equations
Determinants and Cramer's Rule
Partial Fractions
Systems of Nonlinear Equations
Systems of Inequalities

B. Unit Assignment:
After section 10.4, students will use matrix multiplication to project the population proportions of the young, juvenile and adult proportions of a population of animals. Students will use these predictions to analyze the health and growth of the population for the coming seasons in order to understand the long-term prospects of the population.

Mathematical Practices Used in Ch. 10:

- MP.2: Students will analyze a linear system of equations and inequalities and understand that there are multiple methods of solving a system – i.e. substitution, elimination, augmented matrices, Cramer's rule, etc.
- MP.4: Students will understand how to create a matrix to represent data and how matrix operations can be used to analyze the data.
- MP.5: Students will understand how a matrix can be used to represent equations and data and how to algebraically manipulate matrices to solve linear systems.

Chapter 11: Conic Sections *(approximately 9 days)*

STANDARDS
N.VM.7-12, A.REI.7-9, A.REI.12

A. In this chapter, students will understand how conic sections are different cross-sections of a cone. Students will be able to identify the equations of different conics as well as their geometric properties and their graphs.

Major Topics:
Parabolas
Ellipses
Hyperbolas
Shifted Conics
Rotation of Axes
Polar Equations of Conics

B. Unit Assignment:
At the end of the chapter, students will study the use of conics in architecture and how the geometric properties of each conic can create architectural features, such as a whispering gallery. Students will also learn practical methods by which conics could be constructed with by using practical construction tools.

Mathematical Practices used in Ch. 11:

- MP.1: Students will be able to transform the general form of a conic into the standard form of the respective conic to determine key features.
- MP.2: Students will be able to identify the type of conic from the general form.
- MP.4: Students will be able to model real world situations with the appropriate conic type and use the key features to solve problems.

Chapter 12: Sequences and Series *(approximately 9 days)*

STANDARDS
G.GPE.2, G.GPE.3, G.GMD.4

A. In this chapter, students will study different types of sequences, such as geometric, arithmetic and the Fibonacci sequences and their applications in the real world. Students will be able to recognize, formulate and apply sequences to real world situations as well as being able to evaluate the sum of a series.

Major Topics:
Sequences and Summation Notation
Arithmetic Sequences
Geometric Sequences
Mathematics of Finance
Mathematical Induction
The Binomial Theorem

B. Unit Assignment:
At the end of this chapter, students will be able to apply their knowledge of recursive and explicit formulas of a sequence to analyze and evaluate practical problems, such as a monthly savings account as well as the accumulation of pollutants in the environment.

They will be able to predict future values of account balances as well as the percentage of pollutants in the environment after *n* number of years.

Mathematical Practices Used in Ch. 12:

- MP.5: Students will be able to identify the strengths of using the binomial theorem vs. Pascal's triangle but still understand the complementary relationship between the two.
- MP.7: Students will discern a pattern in a sequence or series and identify whether it is arithmetic or geometric.
- MP8: Students will be able to formulate an explicit and/or recursive formula to represent various sequences and series.

Chapter 13: Limits - A Preview of Calculus *(approximately 8 days)*

STANDARDS
N.CN.8, N.CN.9, A-APR.2, A.APR.3

A. In this chapter, students will understand the definition of one-sided and the overall limit and its applications in calculus, such as finding the instantaneous rate of change as well as the area of a bounded region. Students will understand the laws and the definition of alimit of an average rate of change as the instantaneous speed.

Major Topics:
Finding Limits Numerically and Graphically
Finding Limits Algebraically
Tangent Lines and Derivatives
Limits at Infinity; Limits of Sequences
Areas

B. Unit Assignment:
By the end of the chapter, students will apply their knowledge of finding the area under a curve by finding the total distance of a car traveling for a set amount of time at a designated speed, in miles per hour.

Mathematical Practices used in Ch. 13:

- MP.2: Students will be able to determine when the limit of a function exists both algebraically and graphically.
- MP.3: Students will be able to justify why the slope of a tangent line must equal 0 at any local maximum or minimum value and its significance.
- MP.6: Students will be able to clearly communicate the conditions for which the limit of a function does and does not exist.

Chapter 14: Probability and Statistics *(approximately 14 days)*

STANDARDS
A.SSE.4, A.APR.5, A.APR.6, A.APR.7, F.IF.3, F.BF.1a, F.BF.2, F.LE.2

A. In this chapter, students will study events that are governed by randomness and have a predictability to them. Students will understand that not all situations can be precisely determined or calculated, but can be analyzed and predicted using probability rules. Students will be able to collect, organize and analyze data using statistical methods, such as the 5-number summary.

Major Topics:
Counting
Probability
Binomial Probability
Expected Value
Descriptive Statistics (Numerical)
Descriptive Statistics (Graphical)
Introduction to Statistical Thinking
Introduction to Inferential Statistics

B. Unit Assignment:
After section 14.6, students will understand how statistics can be used to mislead and misinform. Students will then be able to analyze studies and newspaper articles that quote statistics and identify sources of potential bias.

Mathematical Practices Used in Ch. 14:

- MP.2: Students will be able to use quantitative reasoning to find the probabilities for events, including conditional probability.
- MP.5: Students will be able to use Venn diagrams appropriately to represent the probabilities for the union and intersection of two events as well as for conditional probability. Students will also be able to use a stem and leaf plot to represent data and to find a 5-number summary.
- MP.6 Students will accurately be able to calculate a 5-number summary in order to properly create a visual summary of the statistics, such as a normalized distribution or a box and whisker plot.

Comprehensive Final Exam Details

1. Students will be tested on their knowledge of the following topics:
    - Prerequisites from Algebra and Geometry
    - Trigonometric Functions
    - Analytic Trigonometry

- Laws of Sines, Cosines
- Polar and Vectors
- Complex Numbers
- Exponential and Logarithmic Functions
- Topics in Analytic Geometry, including Conics
- Functions and Models
- Limits and Derivatives
- Differentiation Rules
- Applications of Differentiation

2. The Final Exams - much like unit/chapter exams - are detail-oriented and require students to provide detailed, step-by-step justification for their responses to each of the questions. This way, they get trained and prepared for their future AP Math courses/exams.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Precalculus Honors (*Formerly Honors Math Analysis)*
Course Code:	*(Educational Services will assign course number **after** Board Approval)*
School(s) Course Offered:	Glendale High School
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated III
Recommended Textbook:	*Precalculus* Josea Eggink, Samantha Falkner, Emily Kaffel, Mark Ray, Jeanne Villeneuve, Karen Wooton, Erin Yao CPM Educational Program Third Edition

Course Overview: Precalculus meets all of the standards for a Common Core 4th Year high school math course. Several big ideas are interwoven, including: functions (e.g., inverse, composite, piecewise), trigonometry, modeling, algebraic manipulation, rates of change, and area under a curve. Students engage with an introduction to several to calculus topics, including limits, area under a curve, and rates of change. On a daily basis, students work collaboratively with others as they use problem-solving strategies, complete investigations, gather evidence, critically analyze results, and communicate clear and effective arguments while justifying their thinking.

The course is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson. With the emergence of new technology, many lessons have moved beyond a traditional handheld device and are written with Desmos eTools as an integral component. The curriculum contains several key labs and hands-on activities to introduce and connect concepts, with an emphasis on modeling.

A focus on algebra is woven throughout the course. Students investigate equivalent expressions and practice setting up word problems right from the start. Students use algebra to manipulate inverse, composite, and piecewise-defined functions as well as investigate characteristics of functions and transformations of functions. Students continue rewriting expressions, solving complicated equations and systems, and use algebra to solve word problems. Algebraic manipulation is practiced throughout the rest of the course as students work with limits, rates of change, trigonometric expressions, complex numbers, series, conic sections, and area under the curve.

Careful consideration was given to the sequencing of the concepts in the course to allow for mastery over time while meeting the content standards of a 4th year course with focus on the 4th year math standards: algebra, functions, trigonometry, complex numbers, conic sections, probability, vectors, and matrices.

This courses covers the same material as Precalculus and adds rates of change, limits and area under the curve.

Course Content:

Semester A

Unit 1: **Preparing for Your Journey** *(approximately 15 days)*

STANDARDS
F.IF.4, F.IF.5, F.BF.1, A.CED.1, A.CED.2, F.IF.5, A.SSE.2, A.APR.6, F.BF.1c, F.BF.4, F.IF.7b

A. This unit is designed to accomplish several objectives:

- Introduce students to some of the main concepts that are part of this course.
- Introduce students to the modeling cycle.
- Have students work with functions, including inverse, composite, and piecewise-defined functions.
- Introduce students to radians and the unit circle.

The opening of this unit establishes a starting point for many of the concepts in this course. Interpreting functions and their graphs will be used extensively in the modeling process throughout the course. Solving word problems as well as algebraic manipulation are skills that are necessary throughout the course.

Progression of Content:
Students are introduced to radians and the unit circle early in the course to facilitate work with trigonometric functions in later units. Students review the inverse functions from a previous course. Understanding domain restrictions will be necessary when students learn about the graphs of the inverse trigonometric functions contained in Unit 2 and Unit 8. After reviewing inverse functions, students will investigate composite functions and use them to algebraically determine if two given functions are inverses of each other. Lastly, students define a radian and use radians to measure angles in the unit circle. This is the start of using the unit circle, which trigonometry will be applied to throughout the course. The last lesson in this section examines angular motion vs. linear motion.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 1:

- Students will model with mathematics, attend to precision, look for and make use of structure as they collect data from the Spring Problem
- Students will make sense of problems and persevere in solving them, construct viable arguments and critique the reasoning of others, look for and make use of structure as they work to find the inverse of functions graphically, on a table, and a rule

Sample Activities:
The Spring Problem - Students engage with a notice and wonder through this activity as they conduct a lab using a spring with a weight attached at the end. In order to gather data from this

activity, students video record the motion of the spring and weight in order to make a table and graph the results. Finally, students use the their model to make various predictions of the position of the wight at different times.

The Inverse of Function - Students will review how to write an inverse function by "undoing" and learn how to algebraically verify that functions are inverses. Students will see the inverse of a function graphically, on a table, and through its rule.

Unit 2: **Functions and Trigonometry** *(approximately 14 days)*

STANDARDS
F.IF.4, F.IF.7, F.BF.3, F.TF.3, F.TF.4, F.IF.7e, F.TF.2, A.REI.10, F.TF.6

A. This unit is designed to accomplish several objectives:

- Describe graphs as increasing/decreasing, concave up/concave down, and state the location(s) of maxima and minima.
- Identify graphs of functions as even, odd, or neither. Or, given the equation of a function, algebraically show that the function is even, odd, or neither.
- Develop fluency with angles and coordinates in the unit circle.
- Generate the parent graphs for sine and cosine and use them in a variety of transformations.
- Generate the parent graphs for inverse sine, inverse cosine, tangent, and inverse tangent.
- Solve basic trigonometric equations over specified domains.

In the first section of this unit, students will review attributes used to describe functions. Concavity will be introduced and students will use algebra to show that functions are even, odd, or neither. Then transformations of functions will be investigated. Again, much of this will be review from a previous course, but will now include horizontal stretches.

In Unit 1, students were introduced to radians and the unit circle. They have practiced a number of problems to reinforce key angle measurements and have worked with special triangles to develop ratios for 45°-45°-90° and 30°-60°-90° triangles. Now they will use these ideas to generate the key coordinates in the unit circle and develop the graphs of sine and cosine.
The second section is devoted to the development of sine and cosine from the standpoint of the unit circle. Students first locate the coordinates for the special angles they used in Unit 1. They then see that the sine ratio corresponds to the y-coordinate and the cosine ratio corresponds to the x-coordinate. Using these values, students develop the Pythagorean Identity. From here, students will graph $y = \sin(q)$ and $y = \cos(q)$ using the unit circle. The section continues with transformations of the graphs of sine and cosine.

In the last section, students begin by solving trigonometric equations. Here students will see that these equations can have multiple, and even an infinite number of, solutions. They will use graphs and the unit circle to generate the solutions to these equations. Students will then use $y = \sin^{-1}(x)$

and $y = \cos^{-1}(x)$ to solve for angles which are not the special angles in the unit circle. Finally, students generate the graphs of inverse sine, inverse cosine, tangent, and inverse tangent.

Progression of Content:
In this unit, students work with transformations of sine and cosine and applied these transformations to a few applications. Then in Unit 8, students extend their work with trigonometric functions to more complex situations; model situations with sinusoidal functions that have both a horizontal shift and a period other than 2π; graph and apply the reciprocal trigonometric functions; develop other trigonometric tools for simplifying expressions using formulas involving sums of angles.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 2:

- Look for and make use of structure, reason abstractly and quantitatively.
- Use appropriate tools strategically, look for and make use of structure, look for and express regularity in repeated reasoning.
- Construct viable arguments and critique the reasoning of others, look for and make use of structure, look for and express regularity in repeated reasoning.
- Use appropriate tools strategically, attend to precision.
- Make sense of problems and persevere in solving them, use appropriate tools strategically, attend to precision, look for and make use of structure.

Sample Activities:
The Unit Circle - Students determine the coordinates of the intersection of the terminal side of a special angle with the unit circle. Students will cut out two special right triangles from a resource page. Sides of the special triangles will be labeled using the exact values on both sides of the paper. This will ensure that the labels are shown when the triangles are flipped over. By placing each of the special right triangles on the x-axis, students will be able to find the coordinates of each of the special angles and repeat the process in all four quadrants to complete the unit circle.

Solving Trigonometric Equations - To solve an equation such as sin x =12, students are directed to draw a unit circle and also graph y = 12, which is a horizontal line. The intersections of the unit circle and the horizontal line will show students the solutions as well as number of solutions. By treating this problem as a system of equations, students are made aware of the connections the solutions are graphically and algebraically. In the same problem, students are asked how many more solutions there could be if we were allowed to continue to revolve around the circle. Eventually the next time students come across this type of problem, they will know to convert the unit circle into a sinusoidal graph and will see the horizontal line having multiple intersections with the sinusoidal graph to help them find all solutions.

Unit 3: Algebra and Area Under the Curve *(approximately 15 days)*

STANDARDS
A.APR.6, A.APR.7, A.SSE.2, A.REI.7, A.REI.11, F.BF.1, A.CED.1

A. In Unit 3, students begin by practicing and strengthening their algebraic manipulation skills as they continue to write equivalent rational expressions and complex fractions. Students learn how substitution can help solve equations and systems of equations. Students then finish up this unit by solving a series of word problems using their algebra skills.

   Another focus of this unit is approximating the area under a curve using summation notation. This concept is one of the major themes of calculus. The goal is to understand what area under a curve can represent and how to approximate it using rectangles.

Progression of Content:
Area under a curve is one of the main ideas in calculus. In this unit, students will be taught background information that will provide a deeper understanding of integration in calculus. The goal in this section is for students to understand the meaning of area under a curve.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 3:

- Students will make sense of problems and persevere in solving them, look for and make use of structure, construct viable arguments and critique the reasoning of others as they add, subtract, multiply, and divide rational expressions.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, reason abstractly and quantitatively as they calculate sums by expanding sigma notation as well as write finite arithmetic series in sigma notation.

Sample Activities
Growth Mindset (Jo Boaler) - In the first lesson of this unit, teachers are encouraged and given the tools to discuss the concepts of the importance of everyone, especially students, learning from their mistakes through error analysis and dendrite growth.

Unit 4: **Polynomial and Rational Functions** *(approximately 14 days)*

STANDARDS
F.IF.7c, A.APR.3, F.IF.4, N.CN.8, N.CN.9, A.APR.6, F.IF.7d, A.CED.1, A.CED.2

A. In this unit, students will apply their knowledge of families of functions to include polynomial and rational functions. Students will investigate the equation ↔ graph connection for these two families of functions, and learn to describe the end behavior of a function. In the first section, students will learn to graph polynomial functions

from the factored forms or their equations.

Students will then work backwards, using graphs to write equations in factored form. Finally, students will learn how to identify all of the roots of a polynomial. Second section begins with a new method for rewriting equations of rational functions is introduced in this section. Students will practice graphing transformations of rational functions. Then students will investigate rational functions that have slant asymptotes and holes.

Finally, students will extend your knowledge of rational functions to graph reciprocal functions. In the last section of the chapter, students will apply what students have learned to solve polynomials and rational equations and inequalities. Finally, students will apply their knowledge of polynomial and rational functions to model and analyze everyday situations.

Progression of Content:
In calculus, polynomials are used to approximate complicated functions because they "behave nicely" and are easy to work with.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 4:

- Students will look for and make use of structure, construct viable arguments and critique the reasoning of others as they graph polynomial functions from equations given in factored form.
- Students will look for and make use of structure as they rewrite rational expressions to transform functions in the form $g(x) = \frac{ax+b}{x-c}$ into transformations of $y = \frac{1}{x-h} + k$.
- Students will look for and make use of structure, construct viable arguments and critique the reasoning of others as they solve polynomial and rational inequalities.

Sample Activities
Polynomial Function Investigation - Students will investigate the graphs of polynomial functions in factored form. Use different numbers of factors with different values of the parameters will show how it will change the graph. Sample of an equation in which students need to change the parameters would is as follows: n(x)=x-a(x-b)(x-c) in which a, b, and c will be different values. Students will have a chance to compare their graphs with their teammates to see the behavior of different types of equations without having to do all of them themselves.

Unit 5: **Exponentials and Logarithms** *(approximately 14 days)*

STANDARDS
A.CED.2, F.IF.7e, F.LE.2, F.BF.5, F.LE.4

A. The start of this unit focuses on exponential functions. Students will apply what they already know about exponential functions to everyday situations. Students will then realize that sometimes two different transformations give the same result, mainly that every exponential function with a horizontal shift is equivalent to a vertical stretch. This shows graphically, as well as algebraically, that every function of the form y = a(bx–h) + k is equivalent to y = A(bx) + k. Furthermore, students will learn about the number e.

In the second half of this unit, students will review, use, and prove the properties of logarithms, each of which corresponds to a property of exponents. Students will also continue solving equations and simplifying expressions that involve logarithms and exponents. This unit is culminated through graphing the family of logarithmic functions and solving application problems.

Progression of Content:
This unit on exponential and logarithmic functions culminates students' engagement in this 4th year course.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 5:

- Students will make sense of problems and persevere in solving them, reason abstractly and quantitatively, model with mathematics, look for and make use of structure as they use exponential functions to model everyday situations
- Students will look for and make use of structure as they understand that for exponential functions, a horizontal shift can be equivalently written as a vertical stretch.
- Students will look for and make use of structure, use appropriate tools strategically, look for and express regularity in repeated reasoning as they practice converting between exponential and logarithmic equations, and investigate the basic properties of logarithms, including natural logarithms.

Sample Activities:
The number *e* - In this activity, students explore what occurs when1 cm2of bacteria reproduces at 100% rate every hour, every minute, every second, and finally every millisecond for one day. A follow up question to this activity is, "What happens to the bacteria if it reproduces *continuously*?" Students will recognize that the base of their exponential model is getting closer and closer to the number *e* and the continuous compound formula A(t)=Pert.

Proving the Logarithmic Properties Card Sort:
In this activity, students prove the Product Property of Logarithms using a card sort. Each team obtains one set of cards. Students arrange the cards in the center of their team's workspace so that everyone can participate. Students then arrange the cards in a logical manner and provide justification for each part of their proof. Justifications can be written on sticky notes or blank cards so that they are easily moved as well. The teacher verifies that each team has the correct proof

before allowing them to move on. Students prove the Quotient and Power Properties in a similar format.

Unit 6: **Triangles and Vectors** *(approximately 15 days)*

STANDARDS
G.SRT.9, G.SRT.10, G.SRT.11, N.VM.1, N.VM.2, N.VM.4, N.VM.5, N.VM.3

A. Two useful tools for solving situational problems are triangles and vectors. Many everyday situations involve triangles, so students will need to be able to solve any triangle with minimal given information. In first section, students will develop and use the Law of Sines and the Law of Cosines to solve non-right triangles. Students will learn to solve triangles when the given information does not create one unique triangle. In the second section, students will learn how to use vectors to describe motion; complete vector operations both graphically and algebraically; apply your knowledge of vectors to solve everyday problems.

Progression of Content:
Students are reintroduced to Law of Sines and Law of Cosines and their applications. But this will most likely be the last time students see a formal lesson on these topics. As for the lessons on vector, since this is a the first introduction to the topic, students who pursue higher math and science course will encounter them again.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 6:

- Students will look for and make use of structure as they prove, understand, and apply the Law of Sines and Law of Cosines. They will also derive the formula $A = 1/2ab\sin(C)$ for the area of a triangle.
- Students will look for and make use of structure, attend to precision, use appropriate tools strategically as they are introduced to vectors and vector notation. They will determine magnitude, direction, and/or components of a vector.
- Students will make sense of problems and persevere in solving them, attend to precision, reason abstractly and quantitatively, model with mathematics, use appropriate tools strategically as they use vectors in real world applications.

Sample Activity:
Vector Line Dance - The Vector Line Dance has students perform a series of moves in the form of a line dance. The idea is that all of the students are doing the same movements but from different starting positions. The starting position does not matter when working with vectors. This activity is "self correcting" in that students should notice if they make a mistake in their direction or distance, since students should move in unison (similar to line dancing). Once students have completed the activity, the class can discuss the idea of everyone making the same

motion (steps and direction), but from different positions. This develops the notion that a vector has a direction and length (magnitude).

Semester B

Unit 7: **Limits and Rates** *(approximately 14 days)*

STANDARDS
Preparation for Calculus (Addition for Precalculus Honors)

A. In mathematics, the concept of a limit can be used to describe the behavior of a function as the independent variable approaches a particular value, or as it becomes arbitrarily large. In the first half of this unit, students will explore how functions behave as x approaches a particular value or goes to infinity. Students will also look at limits from several perspectives including geometry, graphs, tables, and algebra. Students will then learn about one-sided limits and evaluate limits of many functions including rational and piecewise-defined functions. Students will use limits to define continuity.

In the second half of this unit, students will investigate rates of change as they occur in everyday situations and through multiple representations. Often, the most interesting thing about the values in a situation is not the values themselves, but how those values are changing. Is your car speeding up or slowing down? Is the room getting hotter or colder? Furthermore, students will look at the slopes of secant and tangent lines. At the end of this unit, students will use what they have learned about limits to define instantaneous rate of change.

Progression of Content:
Students develop intuitive notions of limits during this unit and refine these ideas in Unit 13. The main focus in this unit is for students to begin to develop the definition of a derivative. The final goal, in Unit 13, is for students to understand what a derivative actually is and what it tells them about a function and its graph.

B. Unit Assignment(s):
Mathematical Practices used in Unit 7:

- Students will use appropriate tools strategically as they evaluate limits geometrically, graphically, on a table, and understand the necessary conditions for a limit to exist.
- Students will make sense of problems and persevere in solving them as they work with limits of functions such asf(x)=sin(x)x.
- Students will look fo and make use of structure as they calculate average rates of change by calculating the slope of the secant line between two data points.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning as they use the limit as $h \to 0$ for the average rate of change to calculate the instantaneous rate of change.

Sample Activity:
Folding Angles - This activity is intended to provide students a tangible example of limits during an engaging activity. In this activity, every student in a group chooses a different acute angle, marks it on their receipt tape, then bisects the supplementary obtuse angle adjacent to their initial angle. By repeating the process, students discover that repeated folds in a given pattern lead to angles ever closer to 60º.

Unit 8: **Extending Periodic Functions** *(approximately 16 days)*

STANDARDS
F.BF.3, F.TF.7, A.CED.2, F.TF.9, F.TF.10

A. In Unit 2, students worked with transformations of sine and cosine and applied these transformations to a few applications. This unit extends their work with trigonometric functions to more complex situations. Students will model situations with sinusoidal functions that have both a horizontal shift and a period other than 2π. Students will graph and apply the reciprocal trigonometric functions. You will also develop other trigonometric tools for simplifying expressions using formulas involving sums of angles.

Progression of Content:
In Calculus, students will be using trigonometric functions to find derivatives and find integrals.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 8:

- Students will look for and make use of structure as they combine a horizontal stretch and shift of the same trigonometric function and set up a modeling problem.
- Students will model with mathematics as they generate trigonometric models for real-world applications.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, use appropriate tools strategically as they graph $y = \csc(x)$, $y = \sec(x)$, and $y = \cot(x)$; prove trigonometric identities.
- Students will use appropriate tools strategically as they use geometry to visualize the trigonometric functions.

Sample Activity:
Graphing Reciprocal Trigonometric Functions - Students will use the graphs of sine, cosine, and tangent to graph their respective reciprocal functions cosecant, secant, and cotangent. Students are encouraged to use the symmetry of the graph to save themselves time. For example, once they have values for sine and cosecant between $x = 0$ and $x = \pi$, they can use the same values (but negative) between $x = \pi$ and $x = 2\pi$. Students will see that the x-intercepts of $y = \sin(x)$ become the

locations of the asymptotes for its reciprocal function. These asymptotes should help students identify the domain and asymptotes for the reciprocal functions.

Unit 9: **Matrices** *(approximately 13 days)*

STANDARDS
N.VM.6, N.VM.7, N.VM.8, N.VM.9, N.VM.10, N.VM 11, N.VM.12, A.REI.8, A.REI.9

A. In this unit, students learn what a matrix is and how matrices, along with a graphing calculator, can be useful tools for organizing data and solving problems. Students then use matrices to solve complicated systems of equations.

   By the second half of the unit, students understand the definition of a linear transformations and relate linear transformations to matrices. Students then investigate compositions of transformations and see how transformations affect geometric figures.

Progression of Content:
This unit is an introduction to matrices, the topic of a Linear Algebra course (usually taken after Calculus) in college. Matrices are also included in college Business Math courses.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 9:

- Students will look for and make use of structure, make sense of problems and persevere in solving them as they add, subtract, and start to multiply matrices.
- Students will look for and make use of structure, look for and express regularity in repeated reasoning, make sense of problems and persevere in solving them, use appropriate tools strategically as they multiply a vector (regarded as a matrix with one row/column) by a matrix of suitable dimensions to produce another vector, and use matrix multiplication to solve problems.
- Students will reason abstractly and quantitatively, look for and make use of structure as they perform linear transformations using matrices.

Sample Activity:
The Toy Factory - Students learn to use matrices to represent linear situations that involve several variables needed to make two types of toys, cars and trucks requiring different amount of wheels, seats, and different costs to manufacture each type of toy. The goal of the activity is for students to determine whether or not a particular request from a buyer can be fulfilled.

Unit 10: **Conics and Parametric Functions** *(approximately 15 days)*

STANDARDS
G.GPE.3.1, F.IF.10

A. In this unit, students will analyze shapes that result from slicing a cone with a plane. These shapes are called conic section. In the first section, students will look at circles, ellipses, hyperbolas, and parabolas. They will generate the conics and derive their equations using the formal definitions. Students will recognize conic sections from their equations and complete the square to rewrite the equations in graphing form. Second section focuses on parametrically-defined functions. Students are introduced to the concept of defining x and y in terms of the parameter t. They will see how parametrically-defined functions can be used to model situations involving motion. The final lesson in this section has students solve problems using projectile motion. This is much more powerful than the past work students have completed with parabolas.

Progression of Content:
In calculus, a chapter is devoted to developing calculus tools for other forms of equations: polar, parametric, and vector.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 10:

- Students will look for and make use of structure, reason abstractly and quantitatively, use appropriate tools strategically, attend to precision as they derive the equation of a circle and practice completing the square, derive the equation of a hyperbola and ellipse, rewrite parametric equations representing conic sections in rectangular form, apply their knowledge of parametric equations to everyday situations.

Sample Activities:
Where is the Center - Students are reintroduced to algebra tiles which they have used in previous course to rewrite quadratic equation into perfect square forms to solve them. Now they will use algebra tiles to complete the square on both x and y variables which will help in rewrite conic section equations into graphing form. The use of the manipulatives allows students, especially those unfamiliar with completing the square or that lack the experience with algebra tiles to get a full understanding as to why it is called completing the square. Once equations of a circle in this problem are rewritten in this form, students can easily identify the center of the circle.

Flick a Coin - This demonstrates how vertical motion is not affected by horizontal motion. To do this, one coin is flicked while the other coin is dropped. The teacher will need to do a demonstration for the whole class. Fold the 3" × 5" index card in half lengthwise, then fold each half (again lengthwise) in the opposite direction. Squeeze the two middle parts together with your thumb and forefinger creating a T when viewed at the end. Turn the folded index card so that the T is upside down. Lay the upside-down T on a table and place a coin on either side of the vertical center. The coins should be laid flat, resting against the center of the T, and near the end. Pinch and hold the side opposite of the coins. Slide the card so that the coins and half of the card extend beyond the edge of a flat surface. Now, imagine that this is a pinball machine flipper and quickly flick your wrist. One coin will be projected forward while the other falls straight down.

Listen carefully for the sounds as they hit the floor. One sound means they hit at approximately the same time. Theoretically, the two coins should hit the ground at the same time, even though the first coin travels a longer path. This is true because the horizontal and vertical motions are independent.

Unit 11: **Polar Functions and Complex Numbers** *(approximately 15 days)*

STANDARDS
F.IF.11, N.CN.3, N.CN.4, N.CN.5, N.CN.6

A. In this unit, students transition from graphing rectangular coordinates (x, y), to polar coordinates, which use a distance and an angle. Students will then apply their work with polar coordinates to the world of complex numbers. They will graph complex numbers and learn to rewrite them in polar form. Furthermore, students will also perform operations with complex numbers in polar form, including multiplying, dividing, and computing powers and roots. This unit culminates with students learning to plot points and graph equations using a radius and an angle, and make conversions between polar and rectangular equations

Progression of Content:
It is not until the second year of Calculus that students revisit polar functions through integration and differentiation.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 11:

- Students will look for and make use of structure, look for and express regularity in repeated reasoning as they graph polar functions, explore various polar functions, graph complex numbers.
- Students will look for and make use of structure as they convert between polar and rectangular forms.
- Students will look for and make use of structure, use appropriate tools strategically as they represent operations with complex numbers geometrically, and use conjugates to determine moduli and quotients of complex numbers.

Sample Activity:
Polar Coordinates Battleship - Directions/rules for the students are as follows:

- Mark your ships on your polar grid. Each ship must be connected to another ship, either along a ray or around a circle.
- Take turns firing out shots. Each target should be stated in four ways: positive radius and positive angle (+, +), positive radius and negative angle (+, −), negative radius and positive angle (−, +), and negative radius and negative angle (−, −). Both players should record the shots on the charts for further reference.

- If you are the opponent, verify that all of the targets stated are the same location. If not, the player forfeits their turn.
- If the shots miss a ship, the opponent declares "miss" and both players place an open circle in the appropriate location. If the shots hit a ship, the opponent declares "hit" and both players mark an X in the appropriate location.
- You must state when a ship is sunk completely.
- The goal is to sink all of your opponent's ships.

Unit 12: **Series and Statistics** *(approximately 15 days)*

STANDARDS
A.SSE.2, A.SSE.4, A.APR.5, S.MD.1, S.MD.2, S.MD.3, S.MD.4, S.MD.5

A. In this unit students will begin by calculating the sums of series. Students will derive formulas for and evaluate the sums of arithmetic and geometric series. Students will use limits to evaluate sums of infinite geometric series. At the end of this section students' skills will be applied to analyze some common situations. Second section begins by looking for patterns in the expansion of (x + y)n and relates the patterns to Pascal's triangle. This leads the use of the Binomial Theorem for the expansion of binomials of the form (a + b)n, where n is a positive integer. Students then apply the patterns from the first lesson of this section to compute probabilities for binomial experiments. In the last section, students will understand what a discrete random variable is as well as the difference between frequency and relative frequency. They will create relative frequency tables for discrete random variables and graph probability distributions as relative frequency histograms. The section continues with calculating the mean and expected value of a discrete random variable. Once students understand these values and how to calculate them, they use these values to make decisions for everyday situations.

Progression of Content:
In Calculus, students will learn tests for determining convergence or divergence of infinite series. And students will learn basic tools if they do decide to move onto a statistical course.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 12:

- Students will look for and make use of structure, look for and express regularity in repeated reasoning, reason abstractly and quantitatively, use appropriate tools strategically as they develop a formula for the sum of an arithmetic series.
- Students will use appropriate tools strategically, look for and make use of structure, reason abstractly and quantitatively as they use limits to determine the sum for infinite geometric series.
- Students will make sense of problems and persevere in solving them, use appropriate tools strategically as they apply their knowledge of sums of geometric series to solve

problems involving everyday situations and develop the concept of a random variable for discrete random variables. They will graph probability distributions associated with random variables. They will calculate and interpret the mean and expected value of a discrete random variable.

Sample Activity:
Quebare - This problem is launched by showing short video for the "game" they are about to play. For the purpose of this problem, Quebare's moves have been restricted to down left and down right. Students are instructed to discuss strategies for determining the exact number of paths to each block. Using isometric dot paper, plastic sleeves, and dry erase pens. Students can then use the resources to test their strategies. Students may or may not notice at this point that they have seen this pattern before. If they recognize it as Pascal's triangle, allow them to share this with the class. Otherwise, let them continue to work the patterns; the paragraph at the end of the lesson addresses the name and significance of the pattern.

Unit 13: **Precalculus Finale** *(approximately 17 days)*

STANDARDS
Preparation for Calculus (Addition for Precalculus Honors)

A. Students learned about limits in Unit 7 by using a graphical approach. In this unit, students will use dominant terms to evaluate limits at infinity and algebraic techniques to evaluate limits at a point. Students will also learn to recognize when a technique is appropriate to use.

Furthermore, in this unit, students will understand what area under a curve represents and how to approximate it using trapezoids, and by writing and using an area under a curve program with a graphing calculator.

This unit is culminated as students build conceptual understanding between the slope of a function and the area under the curve of a function's derivative, two concepts developed throughout this course. You will also learn how to write slope functions for power functions.

Progression of Content:
By the end of this unit, and essentially this course, students will be ready for Calculus.

B. Unit Assignment(s):
Mathematical Practices Used in Unit 13:

- Students will look for and express regularity in repeated reasoning, reason abstractly and quantitatively as they begin a formal understanding of limits. Students will understand what a dominant term is and use the idea of dominant terms to evaluate limits at infinity.

- Students will reason abstractly and quantitatively, attend to precision as they investigate the number e as a limit in the indeterminate form $(1)^{\infty}$ and learn how the number e is important to mathematics.
- Students will attend to precision, construct viable arguments and critique the reasoning of others as they approximate area under a curve using trapezoids and compare the results obtained using trapezoids to results obtained using left endpoint and right endpoint rectangles. Students will also realize that a trapezoidal approximation is the average of left endpoint and right endpoint rectangle approximations.
- Students will make sense of problems and persevere in solving them as they sketch velocity graphs and position graphs and develop connections between the two types of graphs.

Sample Activity:
A Race to Infinity - Through this activity, students will be evaluating eight functions, whose end behavior can be described as follows: x, y. But, the important part is to determine which of these functions would approach infinity faster when comparing exponential, power, and logarithmic functions with b>1. This activity sets the premise for "dominant" functions when students then evaluate algebraic rational expressions containing any of these functions either in the numerator or on the denominator. The end goal of this activity is for students to realize that: (1) exponential functions with larger bases will dominate the exponential family, (2) of the power functions, the function with the highest power will dominate. Since radical expressions can be rewritten using an exponent, they are in the power function family, and (3) that logarithms with the smallest base ($b > 1$) would dominate.

Comprehensive Final Exam Details

1. Students will be tested on their knowledge of the following topics:
    - Prerequisites from Algebra and Geometry
    - Trigonometric Functions
    - Analytic Trigonometry
    - Laws of Sines, Cosines
    - Polar and Vectors
    - Complex Numbers
    - Exponential and Logarithmic Functions
    - Topics in Analytic Geometry, including Conics
    - Functions and Models
    - Limits and Derivatives
    - Differentiation Rules
    - Applications of Differentiation
2. The Final Exams - much like unit/chapter exams - are detail-oriented and require students to provide detailed, step-by-step justification for their responses to each of the questions. This way, they get trained and prepared for their future AP Math courses/exams.

Glendale Unified School District

High School

Date
*(Meeting date will be typed in **after** Board Approval)*

Department:	Mathematics
Course Title:	Precalculus (*Formerly Math Analysis)*
Course Code:	*(Educational Services will assign course number **after** Board Approval)*
School(s) Course Offered:	Clark Magnet High School, Crescenta Valley High School, Hoover High School, Verdugo Academy
UC/CSU Approved (Y/N, Subject):	Y, "c" Mathematics
Course Credits:	Full Year (10)
Recommended Prerequisite:	Integrated III
Recommended Textbook:	*Precalculus: Mathematics for Calculus* James Stewart, Lothar Redlin, Saleem Watson Cengage Learning Seventh Edition
Course Overview:	Precalculus is a 4th year high school mathematics course to solidify and explore deeper concepts and content that students have seen before as well as introducing some new concepts to help prepare them for more advanced mathematics. This course meets all the Common Core state standards for a fourth-year of high school mathematics and is well balanced among procedural fluency (algorithms and basic skills), deep conceptual understanding, strategic competence (problem solving), and adaptive reasoning (application and extension). The course embeds the CCSS Standards for Mathematical Practice as an integral part of each lesson and chapter.

Course Content:

Semester A

Chapter 1: **Fundamentals** *(approximately 20 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, N.CN.7, A.SSE.3a, A.CED.1, A.CED.2, A.CED.3, A.CED.4, A.REI.2, A.REI.3, A.REI.4, A.RED.4a, A.REI.4b, F.IF.1, F.IF.2, F.IF.4, F.IF.5, F.IF.7, F.IF.7b, F.IF.8, G.GPE.1, G.GPE.5, G.GPE.6, G.GPE.7

A. In the first chapter, students will review the real numbers, equations and the coordinate plane. Students will get a fresh look at these review concepts by applying them to real world problems.

Major Topics:
Real numbers
Exponential, radical and rational expressions
Complex numbers
Inequalities
Lines, circles

B. Unit Assignment:
After completing section 1.12, students will use their understanding of proportionality to determine how a frog's size relates to its sensitivity to pollutants in the environment. They will explore how animals, of the same body type, will have a skin area and volume that are proportional to the length of their body. The students will be able to calculate proportionality according to body length, weight, surface skin area, and volume.

Mathematical Practices Used in Ch. 1:

- MP.1: Students will explain to themselves the meaning of a problem and look for entry points to its solution. They analyze givens, constraints, relationships and goals for modeling questions regarding inequalities and proportions. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt.
- MP.2: Students make sense of quantities and their relationships in problem situations. They are able to abstract a given situation and represent the relationship between two variables symbolically, as in direct and indirect variation.
- MP.3: Students learn how to use stated assumptions, definitions and previously established results in constructing arguments and equations to represent real world situations. They will utilize the distance*rate=time equation and proportional relationships to analyze situations that take into account the context of each question.

Chapter 2: **Functions** *(approximately 14 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, A.SSE.3b, A.CED.2, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7a, F.IF.7b, F.IF.8, F.IF.8a, F.BF.1, F.BF.1a, F.BF.1b, F.BF.3, F.BF.4, F.BF.4a, F.BF.4b, F.BF.4c, F.BF.4d, F.LE.2, S.ID.6a, S.ID.6b, S.ID.7

A. In this chapter students will study functions and their graphs, as well as many real-world applications of the functions.

Major Topics:
Graphs of Functions
Average Rate of Change of a Function
Transformations of Functions
Combining Functions
One-to-one Functions and their Inverses

B. Unit Assignment:
After completing Section 2.3, students will give a verbal summary of a situation described by a graph. In this assignment students describe, or tell the story that corresponds to a, given graph as well as make graphs that corresponds to a real-world "story".

Mathematical Practices Used in Ch. 2:

- MP.4: Students will model linear relationships in real world situations and use average rate of change to interpret and quantify the relationship between two variables.
- MP.6. Students will label axes and specify key points to clearly and accurately represent the different type of basic functions such as the linear function, reciprocal function and greatest integer function. Students will also attend to precision for piece-wise functions, ensuring that endpoints are clearly marked and representative of the corresponding domains.
- MP.7: Students will be able to interpret average rate of change within the context of a question and express the significance of the value to the problem. The students will be able to step back and overview transformations of functions as they apply to all types of parent functions and can interpret the structure of functions as a simple transformation on the parent function.

Chapter 3: **Polynomials and Rational Functions** *(approximately 13 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, A.SSE.3b, A.SSE.3c, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7c, F.IF.7d, F.IF.8b, F.BF.1a

A. In this chapter students will study polynomial and rational functions and their graphs, as well as many real-world applications of the functions.

Major Topics:
Quadratic Functions and Models
Polynomial Functions and Their Graphs
Real Zeros of Polynomials
Complex Zeros and the Fundamental Theorem of Algebra
Rational Functions
Polynomial and Rational Inequalities

B. Unit Assignment:
After completing Section 3.2, students will experience the process of collecting data and then analyzing the data using linear regression. In this assignment students will construct bridges out of paper and use pennies as weights to determine how strong each bridge is. Students will model the data with linear and power functions to determine which model best fits the data. The model will allow students to predict the strength of a large bridge before it is built.

Mathematical Practices used in Ch. 3:

- MP.2: Students will be able to reason abstractly by understanding the general importance of a power function to the graph of a polynomial. The students will also be able to contextualize the significance of the end behavior and zeros of the function.
- MP.4: Students can model real world situations with fluctuations by using polynomial functions. They can use the properties of polynomial functions to help contextualize the problem.
- MP.7: Students will be able to discern a pattern in the factored form of a polynomial and its relationship to the x-intercepts of a graph. They will also be able to recognize the significance of the power function of the expanded form of a polynomial and the end behavior of the graph.

Chapter 4: **Exponential and Logarithmic Functions** *(approximately 13 days)*

N.Q.1, N.Q.3, A.SSE.3c, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7e, F.IF.8b, F.BF.5, F.LE.4

A. In this chapter students will study exponential functions where the independent variable is in the exponent. Exponential functions are used in modeling many real-world situations. The inverse function of exponential functions are called logarithmic functions. Once an exponential model has been obtained, students will use the model to predict things such as the size of a population or the growth of an investment.

Major Topics:
Exponential Functions
The Natural Exponential Function
Logarithmic Functions
Laws of Logarithms
Exponential and Logarithmic Equations
Modeling with Exponential Functions
Logarithmic Scales

B. Unit Assignment:
After completing Section 4.3, students will use logarithms or orders of magnitude to compare sizes of objects. It is often difficult to compare objects that vary enormously in size. In this assignment students learn how logarithms can be used to define the concept of "order of magnitude" which provides a simple way of comparison of these objects.

Mathematical Practices Used in Ch. 4:

- MP.2: Students will be able to quantitatively understand the structure of a logarithmic and exponential function separately as well as the inverse relationship of the functions. They will also be able to understand how the key features of a graph are represented in the algebraic expressions.
- MP.4: Students will be able to model a data set by using a linear, quadratic, exponential or logarithmic expression. Students will be able to determine which function best fits the data by identifying key points as well as end behavior.
- MP.5: Students will be able to determine when it is appropriate to use a graphing utility to fit an exponential or logarithmic curve to model a data set.

Chapter 5: **Trigonometric Functions: Unit Circle Approach** *(approximately 12 days)*

STANDARDS
N.Q.2, N.Q.3, F.IF.8, F.LE.2, F.TF.1, F.TF.2, F.TF.3, F.TF.8, G.SRT.6, G.SRT.7, S.ID.6a

A. In this chapter students will study one way of viewing trigonometric functions, as functions of real numbers. Students will see in this chapter how the trigonometric functions are used to model periodic motion.

Major Topics:
The Unit Circle
Trigonometric Functions of Real Numbers
Trigonometric Graphs
Inverse Trigonometric Functions and Their Graphs
Modeling Harmonic Motion

B. Unit Assignment:
After completing Section 5.3 students will consider an application to biology. In this assignment students will use sine functions to model the population of a predator and its prey. An isolated island is inhabited by two species of mammals: lynx and hares. The lynx are predators who feed on the hares, their prey. Students will find functions of the form y=asink(t-b)=c that model the lynx and hare populations from a given graph.

Mathematical Practices Used in Ch. 5:

- MP.2: Students will be able to reason abstractly by understanding how the even-odd properties of a trigonometric function is related to the direction of rotation of the angle measure and the quadrant in which the terminal side is drawn.
- MP.5: Students will be able to determine when it is appropriate to use a graphing utility to model periodic phenomena with a sinusoidal function. Students will be able to fit a trigonometric function by identifying the key features of the graph.
- MP.6: Students will be able to clearly define the meaning of the variables in a trigonometric equation by identifying which is an angle and what specific ratio is defined. Students will also be able to accurately label axes according to the expression being graphed, whether the unit circle or a trigonometric function.

Semester B

Chapter 6: **Trigonometric Functions: Right Triangle Approach** *(approximately 16 days)*

STANDARDS
F.TF.3, F.TF.4, G.SRT.6, G.C.5

A. In this chapter students will study another way of viewing trigonometric functions, as functions of angles. Students will see in this chapter the relationships between angles and distances.

Major Topics:
Angle Measures
Trigonometry of Right Triangles
Trigonometric Functions of Angles
Inverse of Trigonometric Functions and Right Triangles
The Law of Sines
The Law of Cosines

B. Unit Assignment:
After completing Section 6.2 students will investigate how areas and volumes of similar figures change as the size of the figure increases (or decreases). In this assignment students will find power functions that relate these quantities and use

those functions to explore the possibility of the existence of a real-life giant ape. Students will begin by finding some properties of similar figures.

Mathematical Practices Used in Ch. 6:

- MP.1: Students will be able to analyze the given information for an oblique triangle and will persevere in determining the best law (either law of cosines or sines) to solve the triangle. Students will also be able to determine when the ambiguous case for the law of sines applies and will solve for both possible triangles, when necessary.
- MP.3: Students will be able to determine when, for an ambiguous triangle, the second case does or does not work and can create a viable argument as to why.
- MP.4: Students will be able to model real world situations with right and oblique triangles and will be able to use the laws of cosine and sine and the properties of right triangles to determine distances and angles.

Chapter 7: **Analytic Trigonometry** *(approximately 13 days)*

STANDARDS
N.Q.1, N.Q.2, F.IF.7, F.IF.7e, F.TF.4, F.TF.5, F.TF.7, F.TF.8

A. In this chapter students will study algebraic properties of trigonometric functions. Students will simplify and factor expressions and solve equations that involve trigonometric functions.

Major Topics:
Trigonometric Identities
Addition and Subtraction Formulas
Double-Angle, Half-Angle and Product-Sum Formulas
Basic Trigonometric Equations

B. Unit Assignment:
After completing Section 7.3 students will use trigonometry to find the best location from which to view a painting or a movie. In this assignment, students will use graphing devices and the Law of Cosines to find the best viewing angle possible.

Mathematical Practices Used in Ch. 7:

- MP.1: Students will look for entry points to a trigonometric identity proof and will persevere in looking for relationships to equate the two expressions. Students will analyze the given expressions to determine a solution pathway instead of jumping into a solution attempt.
- MP.2: Students will be able to reason through a trigonometric equation by being able to reason abstractly and seeing a quadratic form that requires factorization. Students will also be able to reason quantitatively by identifying the relationships between the ratios of sides with the corresponding angle measures.

- MP.3: Students will be able to build a logical progression of statements to provide a proof for a trigonometric identity by utilizing the quotient identities, Pythagorean identities, as well as the sum, difference, double- and half-angle formulas.

Chapter 8: **Polar Coordinates and Parametric Equations** *(approximately 11 days)*

STANDARDS
F.IF.7, F.IF.7e, F.TF.4, F.TF.5, F.TF.8

A. In this chapter students will study a different way of locating points in the plane. Instead of using rectangular coordinates to specify a location, students will give distance and direction from a fixed reference point.

Major Topics:
Polar Coordinates
Graphs of Polar Equations
Polar Form of Complex Numbers: De Moivre's Theorem
Plane Curves and Parametric Equations

B. Unit Assignment:
After completing the chapter, students will use parametric equations and trigonometry to model the path of a projectile in motion. Students will be able to utilize coordinate geometry to realize how changing the angle of projection affects the domain and range of motion.

Mathematical Practices Used in Ch. 8:
- MP.1: Students will be able to visualize the graphing of a complex number as it relates to right triangle trigonometry and how this relationship allows for the conversion between rectangular and polar systems.
- MP.2: Students will be able to relate the roots of a complex number as points equally spaced about a circle and will be able to relate the periodicity of a sinusoidal function to help identify the polar form of the roots.
- MP.3: Students will be able to analyze the relationship between rectangular coordinates and the path of a point moving on a plane to eliminate a parameter and convert between rectangular and parametric equations.

Chapter 9: **Vectors in Two and Three Dimensions** *(approximately 16 days)*

STANDARDS
N.Q.1, N.Q.2, N.Q.3, F.TF.6, F.TF.7, G.SRT.8, G.SRT.9

A. In this chapter students will be able to represent quantities, such as force, with vectors that are defined by magnitude and direction. Students will also study how several forces acting on an object will affect the movement of that object.

Major Topics:
Vectors in Two Dimensions
The Dot Product
Three-Dimensional Coordinate Geometry
Vectors in Three Dimensions
The Cross Product
Equations of Lines and Planes

B. Unit Assignment:
After completing the chapter, students will use vector fields to model real-world scenarios, like the gravitational force on the earth or wind on the surface of the earth. Students will be able to then analyze the vector fields to identify the center and direction of motion.

Mathematical Practices Used in Ch. 9:

- MP.4: Students will be able to graph vectors in the cartesian system and use the dot product to find the angle between two vectors as well as the direction angles of a vector.
- MP.5: Students will use proper graphing utilities to help them visualize and analyze three-dimensional vectors and cross product vectors.
- MP.6: Students will attend to precision by properly drawing and labeling axes to graph in three dimensions.

Chapter 10: **Systems of Equations and Inequalities** *(approximately 20 days)*

STANDARDS
N.Q.1-3, N.CN.4, N.CN.5, N.VM.1-5, A.REI.5, N.REI.6, G.SRT.10, G.SRT.11

A. In this chapter, students will use more than two variables to create and solve a system of equations and inequalities. Students will be able to adapt the elimination and substitution methods of solving systems with two variables to now solve systems with three or more variables as well as learning new methods of solving, such as utilizing matrices and Cramer's Rule.

Major Topics:
Systems of Linear Equations in Two Variables
Systems of Linear Equations in Several Variables
Matrices and Systems of Linear Equations
The Algebra of Matrices

Inverses of Matrices and Matrix Equations
Systems of Nonlinear Equations
Systems of Inequalities

B. Unit Assignment:
After section 10.4, students will use matrix multiplication to project the population proportions of the young, juvenile and adult proportions of a population of animals. Students will use these predictions to analyze the health and growth of the population for the coming seasons in order to understand the long-term prospects of the population.

Mathematical Practices used in Ch. 10:

- MP.2: Students will analyze a linear system of equations and inequalities and understand that there are multiple methods of solving a system – i.e. substitution, elimination, augmented matrices, Cramer's rule, etc.
- MP.4: Students will understand how to create a matrix to represent data and how matrix operations can be used to analyze the data.
- MP.5: Students will understand how a matrix can be used to represent equations and data and how to algebraically manipulate matrices to solve linear systems.

Chapter 11: **Conic Sections** *(approximately 13 days)*

STANDARDS
N.VM.7-12, A.REI.7-9, A.REI.12

A. In this chapter, students will understand how conic sections are different cross-sections of a cone. Students will be able to identify the equations of different conics as well as their geometric properties and their graphs.

Major Topics:
Parabolas
Ellipses
Hyperbolas
Shifted Conics

B. Unit Assignment:
At the end of the chapter, students will study the use of conics in architecture and how the geometric properties of each conic can create architectural features, such as a whispering gallery. Students will also learn practical methods by which conics could be constructed with by using practical construction tools.

Mathematical Practices Used in Ch. 11:

- MP.1: Students will be able to transform the general form of a conic into the standard form of the respective conic to determine key features.
- MP.2: Students will be able to identify the type of conic from the general form.
- MP.4: Students will be able to model real world situations with the appropriate conic type and use the key features to solve problems.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 11

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

PREPARED BY: Dr. Cynthia M. Foley, Assistant Superintendent, Human Resources
Phyllis Ishisaka, Executive Assistant to the Superintendent

SUBJECT: **Approval of New and Revised Board Policies Relating to Personnel, Instruction, and Administration**

The Interim Superintendent recommends that the Board of Education approve new or revised Board Policies (BP) 4121 (Temporary Contract/Substitute Personnel); BP 6142.91 (Reading/Language Arts Instruction); BP 6142.94 (History-Social Science Instruction); BP 6170.1 (Transitional Kindergarten); BP 6177 (Summer School); and BP 2121 (Superintendent Contract) as recommended by the California School Boards Association (CSBA) and to comply with Education Code and federal and state laws.

BP 4121 – Temporary Contract/Substitute Personnel

CSBA Update: N/A
Last GUSD Update: February 2017

Board Policy (BP) 4121 is revised to add a statement that if a long-term substitute teacher (eleven or more consecutive days) is absent due to illness or bereavement, it shall not constitute a break in the consecutive working days requirement. Currently, a break in long-term consecutive days results in the teacher reverting from the higher long-term substitute rate of $200 per day to $165 per day. This revision is due to the similar policy practiced by surrounding districts such as Los Angeles Unified and Burbank Unified and enables GUSD to remain competitive in recruiting and retaining high quality substitute teachers.

BP 6142.91 - Reading/Language Arts Instruction

CSBA Update: December 2013
Last GUSD Update: N/A

A new policy is adopted based on suggested language and legal references from California School Boards Association (CSBA) regarding reading/language arts instruction.

BP 6142.94 - History-Social Science Instruction
CSBA Update: October 2016
Last GUSD Update: N/A

A new policy is adopted based on suggested language and legal references from CSBA regarding history-social studies instruction. The policy reflects key concepts in the History-Social Science Framework for California Public Schools adopted by the State Board of Education in July 2016, including, but not limited to, a new emphasis on developing student's literacy skills within the context of history-social science instruction. The policy also reflects law that encourages the use of personal testimony through oral history, videos, or other multimedia formats and establishes requirements for personal testimony provided through oral histories.

BP 6170.1 – Transitional Kindergarten
CSBA Update: October 2018
Last GUSD Update: March 2018

BP 6170 is updated to reflect a new law (AB 1808), which allows districts to place four-year-old children enrolled in a California State Preschool Program into a Transitional Kindergarten program and to commingle children from both programs into the same classroom under specified conditions.

BP 6177 – Summer School
CSBA Update: December 2015
Last GUSD Update: December 2010

BP 6177 is updated to reflect current language suggested by the CSBA and legal references.

BP 2121– Superintendent's Contract
CSBA Update: May 2017
Last GUSD Update: July 2016

Board Policy 2121 is updated to reflect new law (SB 1436, 2016), which requires the Board, prior to taking final action on the superintendent's salary or benefits, to orally report a summary of the recommended action during open session of a board meeting. Updated

policy also clarifies that deliberations regarding the superintendent's salary or other compensation cannot be held during a special meeting of the board.

Upon approval of the policies, updates to the accompanying Administrative Regulations will be made as needed following current District procedures.

Copies of the new and revised policies are attached to this report.

Temporary Contract/Substitute Personnel

The Governing Board recognizes that substitute and temporary contract personnel perform an essential role in promoting student achievement and desires to employ highly qualified, appropriately credentialed employees to fill such positions.

Hiring

The Superintendent or designee shall recommend candidates for substitute or temporary contract positions for Board approval, and shall ensure that all substitute and temporary contract employees are assigned in accordance with law and the authorizations specified in their credential.

Substitute personnel may be employed on an on-call, day-to-day basis. They shall be paid at the daily rate of pay established by the Board of Education.

After September 1 of any school year, the Board may employ substitute personnel for the remainder of the school year for positions for which no regular employee is available. The District shall first demonstrate to the Commission on Teacher Credentialing the inability to acquire the services of a qualified regular employee. (Education Code 44917)

Permanent or probationary certificated employees who were laid off pursuant to Education Code 44955 and who have a preferred right of reappointment shall be given priority for substitute service in the order of their original employment. (Education Code 44956, 44957)

Classification

At the time of initial employment and each July thereafter, the Governing Board shall classify substitute and temporary contract employees as such. (Education Code 44915, 44916)

The Governing Board may classify as substitute personnel a teacher hired to fill the position of a regularly employed person who is absent from service. (Education Code 44917)

To address the need for additional certificated employees when regular District employees are absent due to leaves or long-term illness, the Board may classify a teacher who is employed for at least one semester and up to one complete school year as a temporary employee. Any person whose service begins in the second semester and before March 15 may be classified as a temporary employee even if employed for less than a semester. The Board shall determine the number of persons who shall be so employed, which shall not exceed the identified need based on the absence of regular employees. (Education Code 44920)

Teachers who are appointed for a period of eleven or more consecutive days to substitute in the same assignment shall be classified as Long Term substitutes. On the eleventh and subsequent

Temporary Contract/Substitute Personnel

days of service, they shall be paid at the daily rate of pay established by the Board of Education. Days used by the substitute for illness or bereavement shall not constitute a break in the consecutive working days requirement.

The Governing Board also shall classify as temporary contract employees those certificated persons, other than substitute employees, who are employed to:

1. Serve from day-to-day during the first three months of any school term to teach temporary classes which shall not exist after that time, or perform any other duties which do not last longer than the first three months of any school term. (Education Code 44919)

2. Teach in special day and evening classes for adults or in schools of migratory population for not more than four months of any school term. (Education Code 44919)

3. Serve in a limited assignment supervising student athletic activities provided such assignments have first been made available to teachers presently employed in the District. (Education Code 44919)

4. Serve in a position for a period not to exceed 20 working days in order to prevent the stoppage of District business during an emergency when persons are not immediately available for probationary classification. (Education Code 44919)

5. Serve only for the first semester because the District expects a reduction in student enrollment during the second semester due to midyear graduations. (Education Code 44921) SEP

For purposes of classifying employees pursuant to item #1 or 2 above, the school year shall not be divided into more than two school terms. (Education Code 44919)

Salary and Benefits

The Governing Board shall adopt and make public a salary schedule setting the daily or pay period rate(s) for substitute employees for all categories or classes of certificated employees of the District. (Education Code 44977, 45030)

Substitute elementary teachers employed for the morning session only (7:50-11:30), or for the afternoon session only (11:30-3:00), shall be credited with one-half time service and shall be paid one-half of the daily rate paid to day–to-day substitutes. Full-day assignments at the elementary level are from 7:45 am to 3:00 pm. Substitutes employed for the morning session or afternoon session only, shall remain on duty for the full morning or afternoon session.

Temporary Contract/Substitute Personnel

Substitute secondary teachers, employed for one to three teaching periods shall be credited with one-half time service and shall be paid one-half of the daily rate paid to day-to-day substitutes. Substitute secondary teachers, employed for four or more teaching periods, shall be credited with full-time service and shall be paid the full daily rate paid to day-to-day substitutes. In such cases where the teaching assignment is interrupted by a preparation period, the preparation period shall, for pay purposes, be considered equivalent to one teaching period. The substitute teacher shall be considered to be on duty during the preparation period. In such cases where the preparation period follows two consecutive teaching periods, the substitute teacher shall be considered to be on duty during the preparation period.

Any employee hired to provide services in a categorically funded program or project may be employed for a period less than a full school year. He/she may be classified as a temporary contract employee if the period of employment will end at the expiration of that program or project. (Education Code 44909)

Temporary contract employees shall participate in the health and welfare plans or other fringe benefits of the District.

Paid Sick Leave

Except for a retired annuitant who is not reinstated to the retirement system, any temporary or substitute employee who works for 30 or more days within a year of his/her employment shall be entitled to one hour of paid sick leave for every 30 hours worked. Accrued paid sick days shall carry over to the following year of employment, up to a maximum of 48 hours. (Labor Code 246)

An hourly or substitute employee may begin to use accrued paid sick days on the 90th day of his/her employment, after which he/she may use the sick days as they are accrued. (Labor Code 246)

An hourly or substitute employee may use accrued sick leave for absences due to: (Labor Code 246.5)

1. His/her own need or the need of a family member, as defined in Labor Code 245.5, for the diagnosis, care, or treatment of an existing health condition or for preventive care

2. Need of the employee to obtain or seek any relief or medical attention specified in Labor Code 230(c) and 230.1(a) for the health, safety, or welfare of the employee, or his/her child, when the employee has been a victim of domestic violence, sexual assault, or stalking

Temporary Contract/Substitute Personnel

No employee shall be denied the right to use accrued sick days and the District shall not in any manner discriminate or retaliate against an employee for using or attempting to use sick leave, filing a complaint with the Labor Commissioner, or alleging District violation of Labor Code 245-249. The Superintendent or designee shall display a poster containing required information, provide notice to eligible employees of their sick leave rights, keep records of employees' use of sick leave for three years, and comply with other requirements specified in Labor Code 245-249 and in AR 4161.1/4361.1 - Personal Illness/Injury Leave.

Release from Employment/Dismissal

The Governing Board may dismiss substitute employees at any time at its discretion. (Education Code 44953)

The Governing Board may release a temporary contract employee at its discretion if the employee has served less than 75 percent of the number of days the regular schools of the District are maintained. After serving 75 percent of the number of days that District schools are maintained during one school year, a temporary contract employee may be released as long as he/she is Glendale Unified School District notified, before the last day of June, of the District's decision not to reelect him/her for the following school year. (Education Code 37200, 44954)

Reemployment as a Probationary Employee

Unless released from employment pursuant to Education Code 44954, any person employed for one complete school year as a temporary contract employee shall, if reemployed for the following school year in a vacant position requiring certification qualifications, be classified as a probationary employee. With the exception of on-call, day-to-day substitutes, if a temporary contract employee performs the duties normally required of certificated employees for at least 75 percent of the number of days the regular schools of the District were maintained in that school year and is then employed as a probationary employee for the following school year, his/her previous employment as a temporary contract employee shall be credited as one year's employment as a probationary employee for purposes of acquiring permanent status. (Education Code 44917, 44918, 44920)

Vacant position means a position in which the employee is qualified to serve and which is not filled by a permanent or probationary employee. It shall not include a position which would be filled by a permanent or probationary employee except for the fact that such employee is on leave. (Education Code 44920, 44921)

A temporary contract employee hired pursuant to item #1 or #2 in the section "Classification" above shall be classified as a probationary employee if the duties continue beyond the time limits of the assignment. (Education Code 44919)

Temporary Contract/Substitute Personnel

A person employed pursuant to item #5 in the section "Classification" above who is then continued in employment beyond the first semester shall be classified as a probationary employee for the entire school year and shall be reemployed to fill any vacant positions in the District for which he/she is certified. Preference for available positions shall be determined by the Governing Board as prescribed by Education Code 44845 and 44846. (Education Code 44921)

With the exception of on-call, day-to-day substitutes, any temporary contract employee who was released pursuant to Education Code 44954 but who has nevertheless served for two consecutive school years, for at least 75 percent of each year, shall receive first priority if the District fills a vacant position for the subsequent school year at the grade level at which the employee served during either year. In the case of a departmentalized program, the employee shall have taught the subject matter in which the vacant position occurs. (Education Code 44918)

GUSD Reference: Policy and Regulations 4112.2; 4113; 4116; 4117.14/4317.14; 4117.3; 4127/4227/4327; 4140/4240/4340; 4154/4254/4354

Legal Reference: Education Code, Sections §22455.5; 22515; 37200; 44252.5; 44300; 44830; 44839.5; 44845; 44846; 44909; 44914; 44915; 44916; 44917; 44918; 44919; 44920; 44921; 44953; 44954; 44955; 44956; 44957; 44977; 45030; 45041; 45042; 45043; 56060-56063
Government Code, Section §3540.1
Labor Code, Section 220; 230; 230.1; 233; 234; 245-249
Code of Regulations, Title 5, Sections §5502; 5503; 5590, 80025-80025.5
Court Decisions: McIntyre v. Sonoma Valley Unified School District (2012) 206 Cal.App.4th 170; Stockton Teachers Association CTA/NEA v. Stockton Unified School District (2012) 204 Cal.App.4th 446; Neily v. Manhattan Beach Unified School District, (2011) 192 Cal.App.4th 187; California Teachers Association v. Vallejo City Unified School District, (2007) 149 Cal.App.4th 135; Bakersfield Elementary Teachers Assn. v. Bakersfield City School District, (2006) 145 Cal.App.4th 1260, 1277; Kavanaugh v. West Sonoma Union High School District, (2003) 29 Cal.4th 911
Management Resources/Web Sites: CSBA: http://www.csba.org
Commission on Teacher Credentialing: http://www.ctc.ca.gov

Policy Adopted: 05/06/1958
Policy Amended: 08/21/1962; 12/21/1965; 11/04/1986; 03/19/1996; 10/20/1998; 02/03/2004; 10/15/2013; 02/07/2017; 04/16/2019

Formerly BP 4108

Instruction

Reading/Language Arts Instruction

The Board of Education recognizes that reading and other language arts constitute the basic foundation for learning in other areas of study. The Board desires to offer a comprehensive, balanced reading/language arts program that ensures all students have the skills necessary to read fluently and for meaning and develops students' appreciation for literature. The program shall integrate reading and oral and written language arts activities in order to build effective communication skills.

For each grade level, the Board shall adopt academic standards that meet or exceed Common Core State Standards in the following strands:

1. Reading: Foundational skills, text complexity and analysis, and the growth of comprehension

2. Writing: Text types, responding to reading, production and distribution of writings, and research

3. Speaking and listening: Oral language development, comprehension, flexible communication, and collaboration

4. Language: Conventions, effective use, knowledge of language, and vocabulary

The Superintendent or designee shall ensure that the District's reading/language arts program offers sufficient access to standards-aligned textbooks and other instructional materials. The program shall provide instructional materials of varying levels of difficulty, including fiction and nonfiction works, so that students are continually reading at an appropriate level. In addition, technology should be available to support all areas of literacy.

Teachers are expected to use a variety of instructional strategies to accommodate the needs of beginning readers and the varying abilities of more advanced readers. The program shall provide ongoing diagnosis of students' skills and, as needed, may provide supplementary instruction during the school day and/or outside the regular school session to assist students who are experiencing difficulty learning to read.

The Superintendent or designee shall make available professional development opportunities that are designed to provide instructional staff with knowledge about how students develop language skills, the ability to analyze students' literacy levels, and mastery of a variety of instructional strategies and materials.

Instruction

Reading/Language Arts Instruction

The Superintendent or designee shall provide the Board with data from state and District reading assessments and program evaluations to enable the Board to monitor program effectiveness.

Legal Reference: Education Code, Sections 41505-41508; 41530-41532; 44735; 44755-44757.5; 51210; 51220; 60119; 60200.4; 60207; 60350-60352; 60605; 60605.8; 99220-99221; 99230-99242
Code of Regulations, Title 5, Sections 11980-11985; 11991-11991.2
United States Code, Title 20, Sections 6381-6381k; 6383

Policy Adopted: 04/16/2019

Instruction

History-Social Science Instruction

The Board of Education believes that the study of history and other social sciences is essential to prepare students to engage in responsible citizenship, comprehend complex global interrelationships, and understand the vital connections among the past, present, and future. The District's history-social science education program shall include, at appropriate grade levels, instruction in American and world history, geography, economics, political science, anthropology, psychology, and sociology.

The Board shall adopt academic standards for history-social science which meet or exceed state content standards and describe the knowledge and skills students are expected to possess at each grade level.

The Superintendent or designee shall develop and submit to the Board for approval a comprehensive, sequential curriculum aligned with the District standards and consistent with the state's curriculum framework for history-social science. The curriculum shall be designed to develop students' core knowledge in history and social science and their skills in chronological and spatial thinking, research, and historical interpretation. History-social science instruction shall also include an explicit focus on developing students' literacy in reading, writing, speaking, listening, and other language skills.

The Board shall adopt standards-aligned instructional materials for history-social science in accordance with applicable law, Board policy, and administrative regulation. In addition, teachers are encouraged to supplement the curriculum by using biographies, original documents, diaries, letters, legends, speeches, other narrative artifacts, and literature from and about the period being studied.

Personal testimony from persons who can provide first-hand accounts of significant historical events is encouraged and may be provided through oral histories, videos, or other multimedia formats. If oral history is used for instruction related to the role of Americans in World War II or the Vietnam War, such testimony shall exemplify the personal sacrifice and courage of the wide range of ordinary citizens who were called upon to participate in the war, provide views and comments concerning reasons for participating in the war, and provide commentary on the aftermath of the war in Eastern Europe and the former Soviet Union. (Education Code 51221.3, 51221.4)

The Superintendent or designee shall provide a standards-based professional development program designed to increase teachers' knowledge of adopted instructional materials and instructional strategies for teaching history-social science.

Instruction

History-Social Science Instruction

The Superintendent or designee shall regularly evaluate and report to the Board regarding the implementation and effectiveness of the history-social science curriculum at each grade level, including, but not limited to, the extent to which the program is aligned with state standards, any applicable student assessment results, and feedback from students, parents/guardians, and staff regarding the program.

Legal Reference: Education Code, Sections 33540; 51008-51009; 51204; 51204.5; 51210; 51220; 51220.2; 51221; 51221.3-51221.4; 51225.3; 51226.3; 51226.7; 60040-60051; 60119; 60200-60206; 60400-60411; 60640-60649; 99200-99206

Policy Adopted: 04/16/2019

Instruction

Transitional Kindergarten

The Board of Education desires to offer a high-quality Transitional Kindergarten (TK) program for eligible children who do not yet meet the minimum age criterion for kindergarten. The program shall assist TK children in developing the academic, social, and emotional skills they need to succeed in kindergarten and beyond.

The District's TK program shall be the first year of a two-year kindergarten program. (Education Code 48000)

The Board encourages ongoing collaboration among District preschool staff, other preschool providers, elementary teachers, administrators, and parents/guardians in program development, implementation, and evaluation of the District's TK program.

A. Eligibility

1. The District's TK program shall admit children whose fifth birthday is from September 2 through December 2. (Education Code 48000)

2. Parents/guardians of eligible children shall be notified of the availability of the TK program and the age, residency, immunization, and any other enrollment requirements. Enrollment in the TK program shall be voluntary.

3. Upon request of a child's parents/guardians, the District may, on a case-by-case basis after the Superintendent or designee determines that it is in the child's best interest, admit into the District's TK program a child whose fifth birthday is on or before September 1 and who is therefore eligible for kindergarten.

4. The District may, at any time during the school year, but after a child turns five years of age, admit into the TK program a child whose fifth birthday is after December 2 of that same school year, provided that the Superintendent or designee recommends that enrollment in a TK program is in the child's best interest and the child's parents/guardians approve. Prior to such enrollment, the child's parents/guardians shall be provided information regarding the advantages and disadvantages and any other explanatory information about the effect of early admittance. Enrollment of children into TK whose fifth birthday is after December 2 will be on a case-by-case basis and only as space permits in the District's TK classrooms allowing for space for new TK-age student enrollment. (Education Code 48000)

Instruction

Transitional Kindergarten

B. Curriculum and Instruction

1. The District's TK program shall be based on a modified kindergarten curriculum that is age and developmentally appropriate. (Education Code 48000)

2. The program shall be aligned with the preschool learning foundations and preschool curriculum frameworks developed by the California Department of Education. It shall be designed to facilitate students' development in essential skills related to language and literacy, mathematics, physical development, health, visual and performing arts, science, history-social sciences, English language development, and social-emotional development.

3. The Board shall establish the length(s) of the school day in the district's TK program. TK programs may be maintained for different lengths of time either at the same or different school sites, as long as the school day is at least three hours but no more than four hours. The Superintendent or designee shall annually report to the California Department of Education as to whether the district's TK programs are offered full day, part day, or both. (Education Code 37202, 46111, 46115, 46117, 48003)

4. TK students may be placed in the same classrooms as kindergarten students when necessary, provided that the instructional program is differentiated to meet student needs.

5. TK students may be placed in a classroom commingled with 4-year-old students from a California State Preschool Program as long as the classroom does not include students enrolled in TK for a second year or students enrolled in a regular kindergarten. (Education Code 8235, 48000)

C. Staffing

1. The Superintendent or designee shall ensure that teachers assigned to teach in TK classes posses a teaching credential or permit from the Commission on Teacher Credentialing (CTC) that authorizes such instruction.

2. A credentialed teacher who is first assigned to a TK class after July 1, 2015, shall by August 1, 2020, have at lease 24 units in early childhood education and/or child development, comparable experience in a preschool setting and/or a child development teacher permit issued by the CTC. (Education Code 48000)

3. The Superintendent or designee may provide professional development as needed to ensure that TK teachers are knowledgeable about the standards and effective instructional methods for teaching young children.

D. Continuation to Kindergarten

1. Students who complete the TK program shall be eligible to continue in kindergarten the following school year. Parents/guardians of such students shall not be required to submit a signed Kindergarten Continuance Form for kindergarten attendance.

2. However, whenever children who would otherwise be age-eligible for kindergarten are enrolled in TK, the Superintendent or designee shall obtain a Kindergarten Continuance Form signed by the parent/guardian at the beginning of the TK year acknowledging consent for the child's enrollment in TK and enrollment in kindergarten the following school year.

3. A student shall not attend more than two years in a combination of TK and Kindergarten. (Education Code 46300)

E. Assessment

The Superintendent or designee may develop or identify appropriate formal and/or informal assessments of TK students' development and progress. He/she shall monitor and regularly report to the Board regarding program implementation and the progress of students in meeting related academic standards.

Legal References: Education Code, Sections 8235; 8973; 37202; 44258.9; 46111; 46114-46119; 46300; 48000; 48002; 48003; 48200

Policy Adopted: 05/24/2016

Policy Amended: 03/06/2018; 04/16/2019

Instruction

Summer School

The Board of Education recognizes that an extended break from the instructional program may result in significant learning loss, especially among disadvantaged and low-achieving students, and desires to provide opportunities during the summer for students to practice essential skills and make academic progress.

Summer programs offered by the District shall be aligned with the District's local control and accountability plan (LCAP), other applicable District and school plans, and the educational program provided during the school year. When feasible, summer programs shall blend high-quality academic instruction in core curricular and/or elective subjects with recreation, nutrition programs, social and emotional development, and support services that encourage attendance, student engagement in learning, and student wellness.

Summer School

The Superintendent or designee, with Board approval, may establish summer school day and/or evening classes.

The District's summer school program may be used to provide supplemental instruction to students needing remediation and/or enrichment in core academic subjects.

A. Enrollment Priorities

As appropriate, priority for enrollment in summer school programs shall be given to District students who:

1. Need course credits in order to graduate from high school before the beginning of the next school year.

2. Have been retained or are at risk of being retained at their grade level.

3. Demonstrate academic deficiencies in core curriculum areas.

4. Are in targeted student groups identified in the District’s LCAP as needing increased or improved services to succeed in the educational program.

5. The remaining openings shall be offered to other District students on a lottery basis.

Instruction

Summer School

B. Attendance

Because summer courses cover extensive instructional content in a relatively short time period, students who have more than three excused absences or one unexcused absence may not receive credit for summer session class(es) unless they make-up missed work in accordance with law, Board policy, and administrative regulation.

C. Location

Sites for summer school programs may be rotated in an effort to make summer school programs more accessible to all students, regardless of residence or regular attendance area, and to accommodate the maintenance needs of District schools.

D. Evaluation

The Superintendent or designee shall annually report to the Board on summer school enrollment in the current year and previous year for the program as a whole and disaggregated by grade level, school that the students attend during the regular school year, and student population. In addition, he/she may report on the extent to which students successfully achieved the outcomes established for the program.

E. Additional Summer Learning Opportunities

The Superintendent or designee may collaborate with parents/guardians, city and county agencies, community organizations, child care providers, and/or other interested persons to develop, implement, and build awareness of organized activities that support summer learning.

Strategies to support summer learning may include, but are not limited to:

1. Providing information to students and parents/guardians about summer reading programs scheduled to be conducted by public libraries or community organizations.

2. Collaborating with Early Education and Extended Learning Programs to provide day camps and child care.

3. Collaborating with workforce development agencies, businesses, and community organizations to provide summer job training opportunities that include an

academic component.

4. Encouraging reading in the home, such as providing lists of recommended reading to students and parents/guardians, establishing a target number of books or pages, and providing prizes for achievement of reading goals.

5. Conducting occasional, interactive "fun days" during the summer to provide activities related to art, music, science, technology, mathematics, environmental science, multicultural education, debate, or other subjects.

6. Arranging opportunities for community service

Legal Reference: Education Code, Sections 8481-8484.6; 8484.7-8484.9; 37252-37254.1; 39837; 41505-41508; 41976.5; 42238.01-42238.07; 48070-48070.5; 51210; 51220; 51730-51732; 52052; 52060-52077; 54444.3; 56345; 58700-58702; 58806
Code of Regulations, Title 5, Sections 3043; 11470-11472
United States Code, Title 20, Sections 6311-6322; 7171-7176

Policy Adopted: 06/16/1959

Policy Amended: 07/02/1985; 12/06/1994; 03/27/2002; 10/15/2002; 12/14/2010; 04/16/2019

(Formerly BP 6610)

Superintendent Contract

The Governing Board believes that the Superintendent's employment contract should outline the framework through which the Board and Superintendent are to work together to achieve District goals and objectives. When approving the Superintendent's employment contract, the Board shall consider the need for stability in District administration and shall ensure the best use of District resources.

The contract shall be reviewed by the District's legal counsel and may include the following:

1. Term of the contract, which shall be for no more than four years pursuant to Education Code 35031

2. Length of the work year and hours of work

3. Salary, health and welfare benefits, and other compensation for the position

4. Reimbursement of work-related expenses, including mileage reimbursement, consistent with Board policies, regulations, and guidelines applicable to other professional administrative staff

5. Vacation, illness and injury leave, and personal leaves

6. General duties and responsibilities of the position

7. Criteria, process, and procedure for annual evaluation of the Superintendent

8. A statement that any subsequent increase in the Superintendent’s salary shall be at the sole discretion of the Board

9. A statement that there shall be no automatic renewal or extension of the contract, although the Board can enter into a new contract with the Superintendent prior to the expiration of the existing contract

10. Timeline for providing written notice to the Superintendent if the Board does not wish to enter into a new contract, which shall be at least 45 calendar days in advance of the expiration of the term of the contract pursuant to Education Code 35031, and the responsibility of the Superintendent to remind the Board in a timely manner of the requirement to give notice

11. Conditions and process for termination of the contract, including the maximum cash settlement that the Superintendent may receive if the contract is terminated prior to its expiration date

Superintendent Contract

12. Matters related to liability and indemnification against demands, claims, suits, actions, and legal proceedings brought against the Superintendent in his/her official capacity in the performance of duties related to his/her employment

The Board may deliberate about terms of the contract in closed session at a regular meeting. However, discussions regarding the salary, salary schedule, or other compensation may occur in the closed session of a regular meeting between the Board and its designated representative(s), as permitted under Government Code 54957.6 (the "labor exception"), for the purpose of reviewing the Board's position and/or instructing the designated representative(s) prior to or during bona fide negotiations with the current or prospective Superintendent. Such deliberations shall not be held during a special meeting. (Government Code 54956, 54957, 54957.6)

The Board may consult with District legal counsel prior to holding a closed session with the designated representative(s) to discuss compensation to be paid to the current or prospective Superintendent.

Terms of the contract shall remain confidential until the ratification process commences.

The Board shall take final action on the Superintendent's contract during an open session of a regularly scheduled Board meeting, and that action shall be reflected in the Board's minutes. At that meeting, prior to taking action, the Board shall orally report a summary of the recommendation for the final action on the Superintendent's salary or compensation in the form of fringe benefits. (Government Code 3511.1, 53262, 54953)

Copies of the contract and other public records created or received in the process of developing the recommendation related to the Superintendent's salary, benefits, and other compensation shall be available to the public upon request. (Government Code 53262, 54953, 54957.6)

Termination of Contract

Prior to the expiration of the contract, the Board may terminate the Superintendent’s employment contract in accordance with law and applicable contract provisions.

In such an event, any cash settlement that the Superintendent may receive upon termination of the contract shall not exceed his/her monthly salary multiplied by the number of months left on the contract or no greater than the superintendent’s monthly salary multiplied by 12. (Government Code 53260)

Superintendent Contract

The cash settlement shall not include any noncash items other than health benefits, which may be continued for the same duration of time as covered in the settlement or until the Superintendent finds other employment, whichever occurs first. (Government Code 53260, 53261)

However, when the termination of the Superintendent's contract is based upon the Board's belief and subsequent confirmation through an independent audit that the Superintendent has engaged in fraud, misappropriation of funds, or other illegal fiscal practices, no cash or noncash settlement of any amount shall be provided.

In addition, if the Superintendent is convicted of a crime involving an abuse of his/her office or position, he/she shall reimburse the District for payments he/she receives as paid leave salary pending investigation or as cash settlement upon his/her termination, and for any funds expended by the District in his/her defense against a crime involving his/her office or position.

Legal Reference: Education Code, Sections 35031; 41325-41329.3
Government Code, Sections 3511.1-3511.2; 6250-6270; 53243-53243.4; 53260-53264; 54953, 54954; 54956; 54957; 54957.1; 54957.6
United States Code, Title 26, Section 105
United States Code, Title 42, Section 300gg-16
Code of Federal Regulations, Section 1.105-11

Policy Adopted: 07/14/2015

Policy Amended: 02/02/2016; 07/26/2016; 04/16/19

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 12

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Felix Melendez, Executive Director, Secondary Education
PREPARED BY:	Dr. Narineh Makijan, Coordinator III, Career Technical Education
SUBJECT:	**Approval of the College and Career Access Pathways Partnership Agreement**

The Interim Superintendent recommends that the Board of Education approve the College and Career Access Pathways Partnership Agreement with Glendale Community College District.

Assembly Bill 288 – College and Career Access Pathways (CCAP) reduced policy barriers and allowed for the expansion of dual enrollment partnerships between K-12 school districts and community colleges. CCAP has enabled Glendale Community College to broaden the range of students served through dual enrollment programs, including socioeconomically disadvantaged and historically underserved students. The CCAP partnership with GUSD includes uniquely designed dual enrollment programs that meet the needs of local high school students, increase their access to academic programs, and save them time and money on their path to degree and transfer completion.

Concurrent enrollment programs help high school students acclimate to the college environment, reduce their time needed to complete a degree program, increase their likelihood of earning a degree, and cultivate their interest in post- secondary education.

The attached College and Career Access Pathways Agreement will commence in the 2019-2020 school year and is valid for five years. The agreement will continue efforts to expand the GCC Dual Enrollment Program that will include the launch of the Early College Academy in 2019-2020.

COLLEGE AND CAREER ACCESS PATHWAYS

PARTNERSHIP AGREEMENT

This College and Career Access Pathways Partnership Agreement ("Agreement") is made as of the 12th day of October 2018 ("Commencement Date"), by and between the GLENDALE COMMUNITY COLLEGE DISTRICT, a community college district duly organized and existing under the laws of the State of California ("GCCD"), and the GLENDALE UNIFIED SCHOOL DISTRICT, a school district duly organized and existing under the laws of the State of California ("GUSD"). GCCD and GUSD hereby agree as follows:

RECITALS

A. Assembly Bill 288, effective January 1, 2016, authorizes the governing board of a community college district to enter into a College and Career Access Pathways partnership with the governing board of a school district with the goal of developing seamless pathways from high school to community college for career technical education, preparation for transfer, improving high school graduation rates, or helping high school pupils achieve college and career readiness, for the purpose of offering or expanding dual enrollment opportunities for students who may not already be college bound or who are underrepresented in higher education.

B. Assembly Bill 288 allows community college districts to enter into partnership agreements with high schools to outline the terms of the partnership and to establish protocols for information sharing, joint facilities use, and parental consent for high school pupils to enroll in community college courses.

C. Assembly Bill 288 authorizes specified high school pupils to enroll in up to 15 units per term if those units are required for the pupils' partnership programs and would authorize a community college district to exempt special part-time and special full-time students taking up to a maximum of 15 units per term from specified fee requirements.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing recitals and the mutual covenants contained herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. Terms of the Partnership Agreement:

1.1. Term of the Agreement: The term of this Agreement shall be five (5) years from the Commencement Date, unless sooner terminated as provided herein.

1.2. Submission and Amendments: Pursuant to Education Code Section 76004(c)(3), copies of this Agreement shall be filed with both the Chancellor of the California Community Colleges ("State Chancellor") and with the Department of Education before the start of the partnership created by this Agreement. The State Chancellor may void this Agreement if it is determined that this Agreement does not comply with the intent of Education Code Section 76004. Any amendment to this Agreement shall be filed with the State Chancellor. The parties will meet on

an annual basis to determine if the Agreement should be amended, to include but not be limited to adding additional courses and pathways that have been developed.

1.3. Courses Offered Under this Agreement: GCCD shall offer courses to GUSD high school students who are dual enrolled at both GUSD and GCCD. In the initial year of the Agreement, GCCD shall offer the courses on a GUSD campus. GUSD and GCCD may decide to offer classes at the community college in subsequent years within the term of this Agreement.

1.4. Employer of Record: All courses offered under this Agreement shall be taught by faculty employed by GCCD. GCCD shall be the employer of records for these faculty members and shall be responsible for all assignment monitoring and reporting obligations to the county office of education and under applicable federal teacher quality mandates, if any.

1.5. Total Number of High School Student Served Per Year is projected to be: 300.

1.6. Total Number of FTES Projected to be Claimed by GCCD Per Year: 65.

1.7. Apportionment: Pursuant to Education Code Section 76004(s), GCCD shall request and receive state apportionment funding for all college courses offered under the AB 288 Agreement. Pursuant to Education Code Section 76004(r), GUSD shall not seek or receive a state allowance or apportionment funding for any instructional activity for which GCCD requests or receives state apportionment funding. This Agreement or any Addendum must not result in GUSD losing any amount of Average Daily Attendance (ADA). Any courses offered under this Agreement shall be offered at such times to ensure that GUSD students are scheduled to meet minimum day requirements.

1.8. Admission of Special Part-Time or Full-Time Students: GUSD students who take college courses under this Agreement shall be admitted to GCCD as special part-time or special full-time students pursuant to Education Code Section 76001, applicable regulations, and GCCD Board Rules.

1.9. Unit Limit: Pursuant to Education Code Section 76004(p), GUSD students admitted as special part-time students and taking courses under this Agreement, may enroll in up to a maximum of 15 units per term if: 1) the units constitute no more than four community college courses per term; 2) the units are part of an academic program under this Agreement; and 3) the units are part of an academic program that is designed to award students both a high school diploma and an associate degree or a certificate or credential.

1.10. Student Fee Exemptions: Pursuant to Education Code Section 76004(q), GUSD students admitted to GCCD under this Agreement as special part-time students shall be exempt from the following student fees:
1) Student Services Fee 2) Health Fee; 3) Nonresident Tuition Fee (Education Code Section 76140); 4) Transcript Fee (Education Code Section 76223); 5) Enrollment Fee (Education Code Section 76300). A high school pupil enrolled in a course offered through this Agreement shall not be assessed any fee that is prohibited by Section 49011. (Education Code Section 76004(f))

1.11. Textbooks, Equipment, and Materials: GCCD and GUSD shall work collaboratively to seek funding in support of textbooks, equipment and supplies

and other instructional materials as required to support CCAP sections for high school students participating in the program. This may include local school/college sites exploring the use of discretionary resources and seeking federal, state, local and grant funding.

1.12. Reimbursement: For CCAP courses offered at a GUSD school site during a period in which GUSD on-site supervision and facilities, custodial and security personnel are already present, no additional costs shall be incurred by GCCD. If, through an Addendum, GCCD and the GUSD agree to offer a class during a time period in which no GUSD on-site supervision and facilities, custodial and security personnel are present, GCCD will fund the required staffing and reimbursable custodial supplies.

1.12.1. GCCD shall make payment to GUSD within 90 days of receiving the invoice for instructional space and services rendered.

1.12.2. The financial arrangements defined herein may be adjusted annually by a duly adopted written Amendment to this Agreement.

1.13. Student Access and Supports: CCAP courses will be delivered in a nondiscriminatory manner ensuring equity and access to all students.

1.13.1. Services for Students with Disabilities: For CCAP classes offered on GUSD sites during the school day, GUSD will continue to provide services as required by the participating student's Individualized Education Plan ("IEP"). GCCD will make reasonable accommodations to ensure that GUSD is able to implement the student's IEP in CCAP classes. Students may choose to seek ADA academic accommodations pursuant to the American with Disabilities Act through the College's Disability Support Program and Services ("DSPS") Office. If a student is processed through the DSPS Office, GCCD will fund accommodations pursuant to Title II of the American with Disabilities Act. If issues arise in the provision of accommodations and services, the Single Points of Contact from the School and College will meet to bring in the necessary constituencies to resolve the issues in an expeditious manner.

2. Courses Offered Under This Agreement:

2.1. Courses Offered: College and School will determine which courses listed in Appendix A will be offered at the high school under this Agreement. The College and the GUSD high school shall complete the AB288 Addendum which shall become an addendum to this Agreement each year. Each course listed in the AB 288 Addendum shall be offered for the purpose of: 1) preparing students for transfer; 2) improving high school graduation rates; 3) helping high school pupils achieve college and career readiness; or 4) offering or expanding dual enrollment opportunities for students who may not already be college bound or who are underrepresented in higher education with the goal of developing seamless education pathways from high school to college. No physical education courses shall be offered.

2.2. **Pathways**: Pathway is defined by courses that are in the Intersegmental General Education Transfer Curriculum (IGETC) AND courses in a career pathway leading to an industry recognized certificate or credential.

2.3. **Terms in Each AB288 Addendum:** Each Addendum shall: (1) describe the facilities to be used on both the College campus and the GUSD campus; (2) describe the Criteria for Assessing Pupils' Ability to Benefit.

2.4. **Limiting Enrollment**: Pursuant to Education Code Section 76004(o), GCCD may limit enrollment in a community college course solely to eligible high school students if the course is offered at a high school campus during the regular school day and the community college course is offered pursuant to a CCAP partnership Agreement.

2.5. **Transcripts, Permanent Records of Student Achievement, Attendance and Grades**: Both GCCD and the GUSD School of attendance shall record transcript records when courses are completed. Upon receipt of an official transcript from GCCD showing the course title, number of college units and the course grade, the high school equivalent course and the credits allowed will be recorded on the student's cumulative record.

3. **AB 288 Certifications:**

3.1. GCCD Faculty: GCCD certifies that no GCCD instructor who has been convicted of any sex offense, as defined in Education Code Section 87010, or any controlled substance offense, as defined in Education Code Section 87011, shall be retained by GCCD to teach any course on any GUSD campus. All GCCD faculty teaching courses under this Agreement shall meet all state and federal reporting requirements regarding minimum qualifications and conditions.

3.2. No Displacement of Faculty: GUSD certifies that no existing high school teacher who was teaching the same course on the high school campus offered under this Agreement has been displaced or terminated because a community college instructor is teaching that same course. GCCD certifies that a qualified high school teacher teaching a course offered for college credit at a high school campus has not displaced or resulted in the termination of an existing community college faculty member teaching the same course at the partnering community college campus.

3.3. No Reduction of Access to Same Course on GCCD: GCCD certifies that the community college courses offered for college credit on GUSD's campus do not reduce access to the same course offered on GCCD's campus.

3.4. No Oversubscribed Courses: GCCD certifies that community college courses that are oversubscribed or have waiting lists shall not be offered in this Agreement.

3.5. GCCD's Core Mission: Participation in this partnership and this Agreement is consistent with GCCD's core mission pursuant to Education Code Section 66010.4

3.6. No Displacements of Eligible Adults from GCCD Courses: GUSD students participating in this Agreement will not lead to enrollment displacement of otherwise eligible adults from GCCD courses.

3.7. Collective Bargaining: GCCD and GUSD certify that all actions taken pursuant to this Agreement are in compliance with all local collective bargaining agreements.

4. **Remedial Courses**: Should remedial courses be offered, the remedial course taught by GCCD faculty at GUSD's campus shall be offered only to GUSD's high school students who do not meet their grade level standard in math, English, or both, on an interim assessment in grade 10 or 11 as determined by applicable GUSD assessments. GCCD and GUSD faculty shall engage in a collaborative effort to deliver an innovative remediation course as an intervention in the student's junior or senior year to ensure the student is prepared for college-level work upon graduation. It is acknowledged that the student may waive out of a remedial course, should the student choose to exercise that option through the regular college process with their counselor.

5. **Student Discipline Procedures Supervision:** GUSD and GCCD agree to work cooperatively with regard to student discipline. As part of the enrollment process, students will be notified of student discipline policies and procedures, including the GCC Standards of Student Conduct. High school students are subject to GUSD's student discipline procedures, which are governed by Education Code section 48900 et seq. and GUSD policies and procedures, while they attend classes on GUSD's campus. Should this Agreement be extended to courses at the College, high school students will be subject to GCCD's student discipline procedures.

6. **Protocol for Information Sharing**: Any education records or personally identifiable information pertaining to any GUSD students taking courses under this Agreement shall be exchanged between GUSD and GCCD in compliance with the Family Educational Privacy Rights Act (FERPA), Education Code Sections 76200-76246, and GCCD Board Rules. Education records and personally identifiable information regarding GUSD students shall be shared between the Points of Contact identified in Paragraph 6 below. GUSD and GCCD Points of Contact shall then further share that information within their respective institutions as necessary.

7. **Parental Consent**: GUSD and GCCD shall obtain any required parental consent for any GUSD student taking dual enrollment courses under this Agreement.

8. **Implementing Policies and Procedures**: GUSD and GCCD will each develop policies and procedures consistent with the terms of this Agreement. Each party will distribute the policies and procedures to each participating high school principal and college instructor prior to the implementation of the CCAP program.

9. **Points of Contact at GCCD and GUSD**: The following officials shall serve as the point of contact under this Agreement:

GUSD:		GCCD:	
Name:		Name:	Tzcler Oukayan
School Address:	223 N. Jackson Street, Glendale, CA 91206	School Address:	1500 N. Verdugo Road, Glendale, CA 91208
Phone:	(818) 241-3111	Phone:	(818) 240-1000 ext. 5594
Fax:	(818) 548-9041	Fax:	(818) 551-5289

10. **Annual Reporting to the State Chancellor:** On or before January 1 of each year of this Agreement, GUSD and GCCD shall submit a joint report to the State Chancellor based on data from GCCD. The report shall state: 1) the total number of GUSD students, by school site, taking courses under this Agreement, aggregated by gender and ethnicity, and reported in compliance with all applicable state and federal privacy laws; 2) the total number of community college courses offered under this Agreement by course category and type and by school site; 3) the total number and percentage of successful course completions, by course category and type and by school site; and 4) the total number of full-time equivalent students generated through courses offered under this Agreement. By October 1 of each year of this Agreement, the Points of Contact from GUSD and GCCD shall meet to plan and commence the preparation of the joint report.

11. **Mutual Defense and Indemnity:** GCCD shall indemnify and hold harmless GUSD, its officers, agents, and employees for any and all loss, cost, expense, claims or liability for injury to or death of any person, or damage to any property, caused by the negligence and/or tortuous conduct of GCCD in the performance of GCCD's responsibilities under this Agreement. In such an event, GCCD, at its own expense, shall also defend all actions, suits, or other proceedings brought against GUSD, its officers, agents, or employees and satisfy any judgment rendered against GUSD, its officers, agents, or employees because of such negligence and/or tortuous conduct. Similarly, the GUSD shall indemnify and hold harmless GCCD, its officers, agents, and employees for any and all loss, cost, expense, claims or liability for injury to or death of any person, or damage to any property, caused by the negligence and/or tortuous conduct of GUSD in the performance of GUSD's responsibilities under this Agreement. In such an event, GUSD, at its own expense, shall also defend all actions, suits, or other proceedings brought against GCCD, its officers, agents or employees and satisfy any judgment rendered against GCCD, its officers, agents, or employees because of such negligence and/or tortuous conduct.

12. **Insurance**: Without limiting the parties' indemnification obligations herein and as a material condition of this Agreement, each party shall maintain, at its expense and for the duration

of this Agreement, a program of insurance or self-insurance and provide evidence thereof, as required below, against claims for injury, damage or loss that may arise from or in connection this Agreement and/or the use of facilities under the Agreement. Each party shall furnish the other party with certificates of insurance or other satisfactory documentation of all insurance or self-insurance required by this Agreement. Each party shall have the other party added as additional insureds to all of the following policies. The Minimum Scope and Limits of Insurance shall be as follows (coverage shall be at least as broad):

Commercial General Liability Insurance "occurrence" form only to provide defense and indemnity coverage to the insured for liability for bodily injury, personal injury, and property damage, of not less than a combined single limit of Five Million Dollars ($5,000,000.00) per occurrence. The general aggregate limit shall be twice the required per occurrence limit. If such insurance is obtained from a third party insurer and not self-insured, the insuring party shall name the other party as an additional insured on the policy.

Business Automobile Liability Insurance to provide defense and indemnity coverage to the Insured for liability for bodily injury and property damage covering owned, non-owned, and hired automobiles of not less than a combined single limit of One Million Dollars ($1,000,000) per occurrence. If such insurance is obtained from a third party insurer and not self-insured, the insuring party shall name the other party as an additional insured on the policy.

Workers' Compensation Insurance as required by the Labor Code of the State of California, and Employers' Liability insurance with limits of not less than One Million Dollars ($1,000,000.00) per accident. Any notice required to be served hereunder shall be in writing.

Choice of Law and Venue: This Agreement, its interpretations, performance or any breach thereof, shall be construed in accordance with, and all questions with respect thereto shall be determined by, the laws of the State of California applicable to contracts entered into and wholly to be performed within the State of California. Los Angeles County shall be the venue for all legal matters concerning the Agreement.

13. **Termination:** Either party shall have the right to terminate this Agreement without cause by providing to the non-terminating party a written notice of termination. Notice of termination shall be provided at least 180 days prior to the termination date. Each party shall continue to fulfill its obligations under this Agreement until date of termination.

14. **Notices:** Any notices to be given pursuant to this Agreement shall be in writing and such notices, as well as any other document to be delivered, shall be delivered by personal service or by deposit in the U.S. Mail, certified or registered, return receipt requested, postage prepaid, and addresses to the party for whom intended as follows:

To GUSD:

GLENDALE UNIFIED SCHOOL DISTRICT
Office of the Superintendent
223 North Jackson Street
Glendale, California 91206
To GCCD:

GLENDALE COMMUNITY COLLEGE DISTRICT
Business Services
1500 North Verdugo Road
Glendale, California 91208

16. **Miscellaneous**: This Agreement constitutes the entire agreement between the parties hereto pertaining to the subject matter hereof and all prior and contemporaneous agreements, representations and understandings of the parties hereto, oral or written, are hereby superseded and merged herein. No supplement, modification or amendment of this Agreement shall be binding unless in writing and executed by all parties hereto. No waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provisions, whether or not similar, nor shall any waiver be a continuing waiver. No waiver shall be binding unless executed in writing by the party making the waiver. This Agreement shall be construed and enforced in accordance with, and governed by, the law of the State of California. The headings of this Agreement are for purposes of reference only and shall not limit or define the meaning of the provisions hereof. This Agreement may be executed in any number of counterparts, each of which shall be an original and all of which shall constitute one and the same instrument.

17. **Board Approval Required**. This Agreement is conditioned upon the approval of the governing boards of both the GUSD and GCCD as set forth by Education Code Section 76004.

IN WITNESS WHEREOF, GCCD and GUSD have executed this Agreement as of the date first above written.

GLENDALE UNIFIED SCHOOL DISTRICT

By: _____
Name:
Title:
Date:

GLENDALE COMMUNITY COLLEGE DISTRICT

By: _____
Name: David Viar
Title: Superintendent/President
Date: March 19, 2019

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 13

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

SUBMITTED BY: Felix Melendez, Executive Director, Secondary Education

SUBJECT: **Acceptance of DonorsChoose Award**

The Interim Superintendent recommends that the Board of Education accept funding from DonorsChoose to support a project submitted by Rosemont Middle School.

DonorsChoose is an organization that connects concerned individuals, called "Citizen Philanthropists," with classroom teachers, to provide funds or materials for class projects. Public school teachers create student project proposals and submit the one-page essay and list of resources needed. These concerned individuals fund the student projects of their choice, in whole or in part.

DonorsChoose purchases the student materials and ships items directly to the school, using a network of partnerships and vendors. Teachers are required to complete a feedback package, including documenting the project with photographs, which in turn are shared with the individual that funded the project.

The following project was submitted and awarded by DonorsChoose:

Rosemont Middle School – Mary Inglish, Teacher
Project: Chromebooks Needed for Classroom Research!
This project was awarded $558.60 to purchase two HP 11.6" Chromebooks valued at $558.60. The items will be used daily in Ms. Inglish's eighth grade classroom to research and learn information in new and exciting ways. Students will have access to up-to-date information for research and other assignments.

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 14

TO:	Board of Education
FROM:	Dr. Kelly King, Interim Superintendent
SUBMITTED BY:	Dr. Chris Coulter, Director, Teaching & Learning
PREPARED BY:	Melanie Doody, Secondary Math Teacher Specialist Amy Besoli, Math Department Chair, Crescenta Valley High School
SUBJECT:	**Approval of Agreement with the University of California, Los Angeles, Graduate School of Education and Information Studies-Center X to Provide Professional Development Training and Support for Introduction to Data Services Course**

The Interim Superintendent recommends that the Board of Education approve a two-year agreement in the amount of $25,710 with the University of California, Los Angeles, Graduate School of Education and Information Studies-Center X to provide professional development training and support for the Introduction to Data Services course.

The Interim Superintendent has approved to pilot an Introduction to Data Science (IDS) course at Crescenta Valley High School in the 2019-2020 school year. Students who have completed Integrated II or Algebra 2 may choose to enroll in this course. Students who would otherwise take Math Thinking or Trig/Stats will be invited to enroll in this course. To prepare for this pilot, curriculum training and support for staff is needed.

Background:
GUSD currently offers "Math Thinking" for seniors who have completed their graduation requirements of Integrated I and Integrated II. The purpose of this course is to keep students engaged in mathematics in their fourth year of high school and to help prepare students for college entrance exams, especially those at community colleges. "Math Thinking" is not an a-g approved course. The requirements for placement in the community college mathematics courses have changed.

Some students enroll in a one year course that includes a semester of Trigonometry and a semester of Statistics (Trig/Stats) if they do not feel prepared for Precalculus. Although Trig/Stats is currently a-g approved, the course needs to be rewritten and new materials adopted and purchased to match California State Standards.

Overview:
Introduction to Data Science (IDS) is a course that combines mathematical concepts of statistics with the computer science of coding. It is a rigorous, a-g approved mathematics course developed by the University of California, Los Angeles (UCLA) Center X in partnership with the National Science Foundation, Mobilize, and the UCLA Department of Statistics. The Common Core State Standards (CCSS) for High School Statistics and Probability relevant to data science are taught along with the data demands of good citizenship in the 21st century. Exploratory Data Analysis is the cornerstone of IDS Instruction. Students will collect, interact with, and analyze data.

IDS offers students an a-g approved course to students who possess sufficient mathematical maturity and quantitative reasoning ability. This a rigorous mathematics course that does not require higher level mathematics to be successful.

IDS can meet GUSD students' needs in two ways:

As a 4th year course:
AB 705, which took effect January 1, 2018, calls for all community colleges to change criteria for math placement. Placement would be decided on multiple measures, not a placement exam. Math Thinking's curriculum prepared students for this placement exam and now that the placement measure is no longer used, the purpose for Math Thinking and its curriculum needs have changed. There needs to be a 4th year course for these students that is both engaging and cutting edge, all while giving them life-long skills. This course may even spark a renewed interest in statistics or a new interest in coding or computer programming.

As a 3rd year course:
Students who are interested in more of a liberal arts math focus in high school could take IDS as a 3rd year course after successful completion of Integrated Math I and II. The hands-on approach to the IDS course will give the students valuable insight before enrolling in the AP Statistics course the next year. These students would complete the a-g requirements without having to take Integrated Math III and Pre-Calculus all while gaining knowledge that is useful for future college and/or career.

Possible alternate pathways include:
Integrated I -> Integrated II-> IDS -> AP Statistics
Integrated I -> Integrated II -> Integrated III -> IDS

IDS could also be taken as an elective math course for students on a Calculus pathway.

Resources Required:

- IDS has no textbook. A dedicated class set of chrome books is needed.
- Extensive professional development is required to teach this course. Mrs. Amy Besoli, Math Department Chair from Crescenta Valley High School, has eagerly volunteered to participate in the nine days of training required in the first year and four days of training required in the second year.

Professional Development training and support for IDS curriculum implementation is required. The total cost of the agreement with UCLA Graduate School of Education and Information Studies-Center X, valid for two years (2019 - 2021), is $25,710.

Training will commence in Summer 2019. Staff will monitor and evaluate the effectiveness of the course and will seek Board of Education approval of the IDS course should it be determined to expand the course to Glendale, Hoover, and Clark Magnet High Schools in the 2020-2021 school year.

The professional development services will be funded by the Educational Services and Teaching and Learning departments.

AGREEMENT
FOR
CONSULTANT SERVICES
UCLA
Graduate School of Education & Information Studies

Glendale Unified School District herein after referred to as The District, and The Regents of the University of California on behalf of the Introduction to Data Science (IDS) Project/UCLA GSE&IS Center X, hereinafter referred to as Consultant, enter this agreement this **22nd** day of **March, 2019** and mutually agree as follows:

1. The District requires from time to time the services of a consultant in curricular areas.

2. The Consultant is a professional and is qualified to perform the services in the area of *Professional Development-Introduction to Data Science (IDS)* required by this agreement.

   Description of Services

   a. Develop and enhance teacher's content knowledge and instructional strategies aligned with the California Board of Education adopted standards and frameworks.
   b. Expand statewide opportunities for professional development by developing a network of teacher leaders who are capable of assuming leadership roles in their profession.
   c. Improve the achievement of students in low performing schools through the development of partnerships.
   d. Develop and maintain professional education communities that create opportunities for teacher networking and learning.

3. While performing services hereunder, the Consultant is an independent contractor and not an officer, agent or employee of the District and he/she will not present himself/herself as an officer, agent or employee of the District.

4. UNIVERSITY shall defend, indemnify, and hold District, its officers, employees and agents harmless from and against any and all liability, loss, expense (including reasonable attorneys' fees), or claims for injury or damages arising out of the performance of this Agreement but only in proportion to and to the extent such liability, loss, expense attorneys' fees or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of UNIVERSITY, its officers, employees, or agents.

5. ***Glendale Unified School District*** shall defend, indemnify, and hold UNIVERSITY, its officers, employees and agents harmless from and against any and all liability, loss, expense (including reasonable attorneys' fees), or claims for injury or damages arising out of the performances of this Agreement but only in proportion to and to the extent such as liability, loss, expense, attorneys' fees or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of ***Glendale Unified School District*** its officers, employees or agents.

6. This agreement is effective **June 1, 2019** and shall continue in effect until terminated on **June 30, 2021** and shall not exceed the sum of $**25,710** for 2 years (2019-2021) for training and support for IDS curriculum implementation (54 hours of PD in Year 1; 24 hours of PD in Year 2; virtual office hours throughout the partnership (Years 1-2). See MOU for a more detailed description of services and cost structure, or go to the ***IDS 2-Year Partnership Program and Cost Structure*** document: **https://tinyurl.com/IDS-Partnership-Costs**

The fee shall be paid by The ***Glendale Unified School District.*** The fee includes coordinator fees, presenter fees, and presentation materials.

7. Consultant will provide the School/District with a bill for services performed and payment will be based on days of service actually performed. The school/district will be billed in the following manner: see ***Payment Schedule*** below. Checks will be made payable to Regents of UC upon receipt of an invoice. *Payment is due upon receipt of a UC invoice.*

Payment Schedule:

Invoice #1:	December 2019	Amount: $7,365
Invoice #2:	June 2020	Amount: $7,365
Invoice #3:	December 2020	Amount: $5,490
Invoice #4	June 2021	Amount: $5,490

8. Cancellation Policy: The district must notify the consultant at least 48 hours in advance of canceling a service. A fee of 50% of the contracted amount will be charged to the district if the service is cancelled within less than 48 hours.

9. UCLA's Federal Taxpayer Identification Number is 95-6006143

10. Please note that our Vendor Number is: 1000004459 UC REGENTS UCLA CENTER X

11. Professional Development:
Specific Dates: TBD
As noted in the ***IDS 2-Year Partnership Program and Cost Structure*** document **(https://tinyurl.com/IDS-Partnership-Costs**), a total of 13 days (78 hours) of professional development (PD) will be offered to district partners for the contractual period (2019-2021):

Year 1 (2019-2020): 9 days/54 total hours of IDS PD
- 3 days (18 hours) of PD in June 2019
- 2 days (12 hours) of PD in August 2019
- 4 follow-ups (6 hours each, 24 hours total) during the 2019-20 academic year
- **$6,750 per PD participant**

Year 2 (2020-2021): 4 days/24 hours of PD
- Focus: Advanced content and skills for teachers
- **$3,000 per PD participant**

Technology: See ***IDS 2-Year Partnership Program and Cost Structure*** document **(https://tinyurl.com/IDS-Partnership-Costs**) for details of Full Technology Package:

Year 1 (2019-2020): Full Technology Package
- Minimum commitment: 2 IDS sections per teacher
- **$3,990 per section**

Year 2 (2020-2021): Full Technology Package
- Minimum commitment: 2 IDS sections per teacher
- **$3,990 per section**

Contact:
Felix Melendez
Executive Director of Secondary Education
Email: fmelendez@gusd.net

Provider:
The Regents of the University of California
UCLA Graduate School of Education
& Information Studies-Center X | PROJECT

Address: Glendale Unified School District
223 North Jackson Street
Glendale, CA 91206

Address: UCLA-Center X
Attn: Courtney Sidler
1320 Moore Hall
Box 951521
Los Angeles, CA 90095

Phone: (818) 241-3111

Phone: 310-825-0862
Fax: 310-267-4751

Approved by UCLA Center X:

Annamarie Francois/Courtney Sidler ___ CA Sidler ___ Date: 3/22/2019
Print Name Authorizing Signature

Executive Director/Director of Business Administration
Title

Approved by Glendale Unified School District

Dr. Kelly King _____ _____ Date: _____
Print Name Authorizing Signature

Interim Superintendent
Title

GLENDALE UNIFIED SCHOOL DISTRICT

April 16, 2019

CONSENT CALENDAR NO. 15

TO: Board of Education

FROM: Dr. Kelly King, Interim Superintendent

SUBJECT: **Acceptance of Gifts**

The Interim Superintendent recommends that the following gifts to the District be accepted and that letters of appreciation be written to the donors:

a. In-N-Out wish to donate to the District through the Categorical Programs Department 40 gift cards for a free hamburger to be used to support the Adelante Latinos event.

b. Hoover High School Administrators wish to donate to the District through the Categorical Programs Department $100.00 to be used to support the Adelante Latinos event.

c. Porto's Bakery and Café wish to donate to the District through the Categorical Programs Department pastries to support the Adelante Latinos event.

d. Glendale Council PTA wish to donate to the District through the Child Welfare and Attendance/Student Support Services Department $300.00 to be used as needed in the 2018-19 school year.

e. Korean Parent Club wish to donate to the District $650.00 to be used to purchase Chromebooks for use at Lincoln Elementary School.

f. Abraham Lincoln Elementary School Foundation wish to donate to the District $6,600.00 to be used to purchase Chromebooks for use at Lincoln Elementary School.

g. Parker-Anderson Learning Center LA wish to donate to the District $290.00 to be used to purchase instructional materials and supplies for use at Monte Vista Elementary School.

h. Mr. & Mrs. Kim wish to donate to the District $1,000.00 through the Korean Parents Club to be used toward the purchase of Chromebooks for use at Rosemont Middle School.

i. Special Olympics Southern California wish to donate to the District $908.00 to be used for students with disabilities at Toll Middle School.